ORDER NO.PHAMOS0506022A3

Service Manual

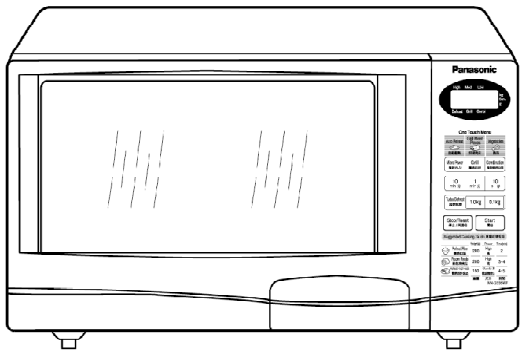
Microwave Oven

Simplified

NN-G315WF / NN-G335WF / NN-G335MF / NN-G335BF /

HPE(Hong Kong)
LPK(Philippines)
YTE(Others)
KTE(UAE)
PTE(Iran)
ZPE(CIS Countries)

Please file and use this manual together with the service manual for Model NN-S215/S235 (Order No.PHAMOS0506021C3).



SPECIFICATIONS

Specification

Model		G315WF	G335WF/MF/BF
Power Source:		220VAC Single Phase,50Hz _ _ _ _ _ _ _ _ _ For KTE, ZPE, HPE,YTE, PTE Models 220-230VAC Single Phase,60Hz _ _ _ _ _ _ For LPK Models	
Power Requirement:	Microwave	1200W	1200W
	Heater	1130W	1130W
Output:	Microwave	800W	800W
	Heater	1100W	1100W
Microwave Frequency:		2450MHz	
Timer:		35min.	29min.90sec
Outside Dimensions:		364mm(D) x 482mm(W) x 282mm(H)	
Oven Cavity Dimensions:		330mm(D) x 325mm(W) x 191mm(H)	
Weight:		11.5kg	
PbF		This product with PbF	
Specifications subject to change without notice.			

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⚠ WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public. It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product.
Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

WARNING

1. This product should be serviced only by trained, qualified personnel.
2. Check for radiation leakage before and after every servicing according to the "procedure for measuring radiation leakage."
3. If the unit cannot be repaired on site, advise the customer not to use until unit is repaired.
4. There are special components used in the microwave oven which are important for safety. These parts are marked with a ⚠ on the replacement parts list. It is essential that these critical parts be replaced only with the manufacture's specified parts to prevent microwave leakage, shock, fire, or other hazards. Do not modify the orginal design.

This service manual covers products for following markets.
When troubleshooting or replacing parts, please refer to the country/area identifications shown below for your applicable product specification.

HPE ..... For Hongkong
LPK ..... For Phillipines
YTE ..... For Others
ZPE ..... For CIS Countries
KTE ..... For UAE
PTE ..... For Iran

CAUTION

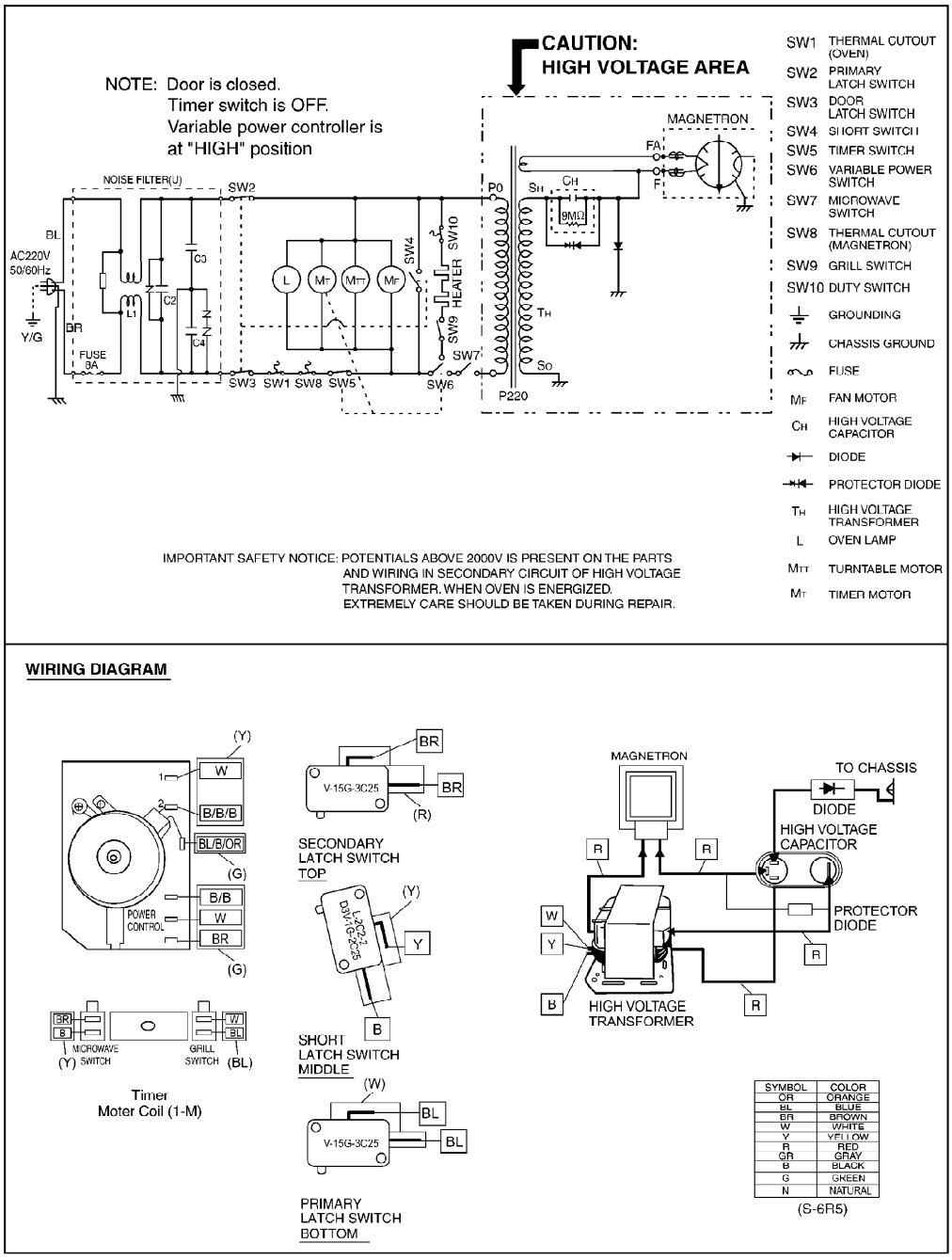
About lead free solder (PbF)

Distinction of PbF PCB: PCBs (manufactured) using lead free solder will have a PbF stamp on the PCB.

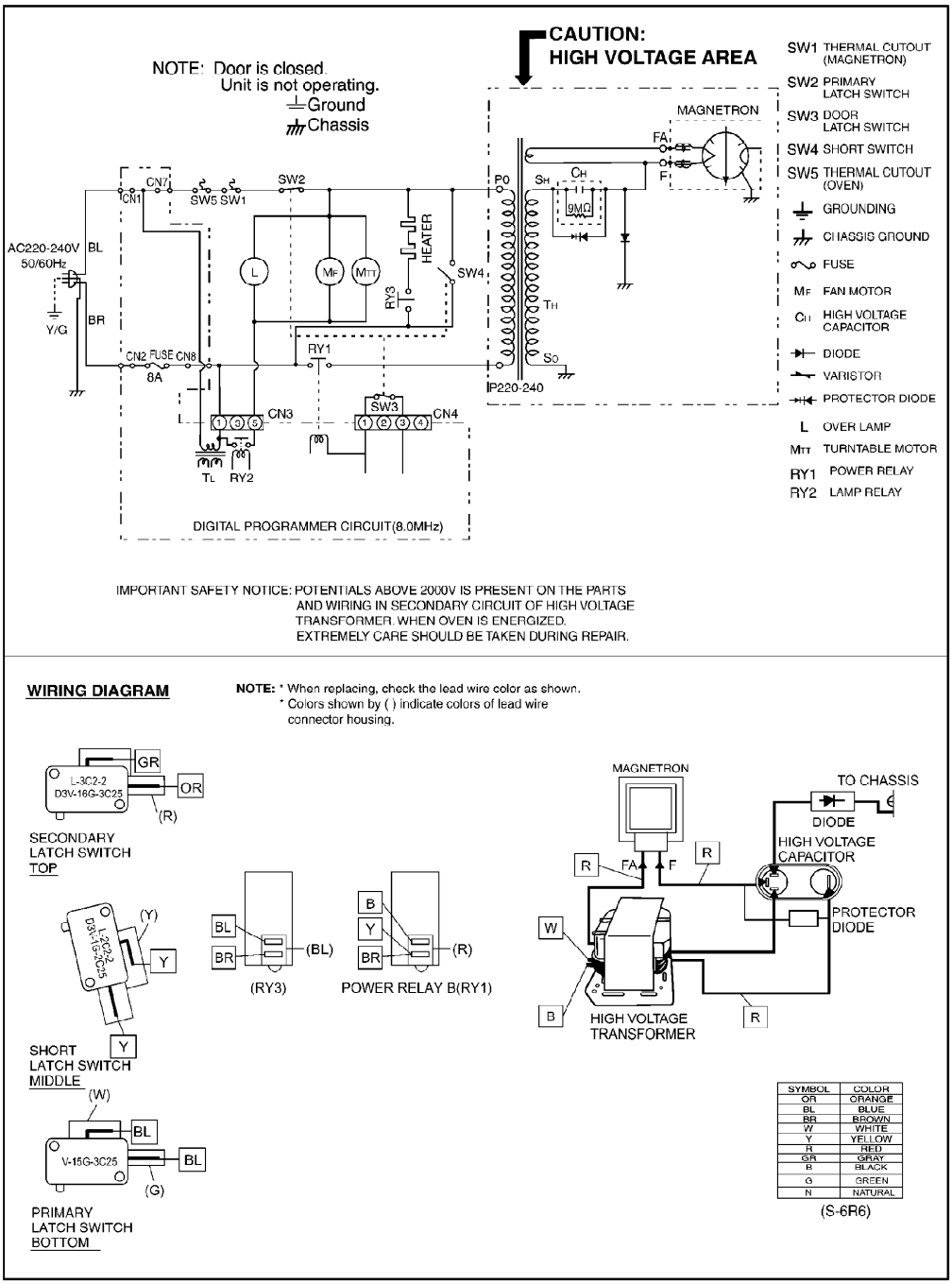
Caution:
- Pb free solder has a higher melting point than standard solder; Typically the melting point is 30 - 40˚C higher. Please use a high temperature soldering iron. In case of the soldering iron with temperature control, please set it to 370 ± 10˚C.
- Pb free solder will tend to splash when heated too high (about 600˚C).

1. SCHEMATIC DIAGRAM

1.1. NN-G315



1.2. NN-G335



2. CAUTIONS TO BE OBSERVED WHEN TROUBLESHOOTING

Unlike many other appliances, the microwave oven is high-voltage, high-current equipment. Though it is free from danger in ordinary use, extreme care should be taken during repair.

CAUTION
Servicemen should remove their watches whenever working close to or replacing the magnetron.

2.1. Check the grounding

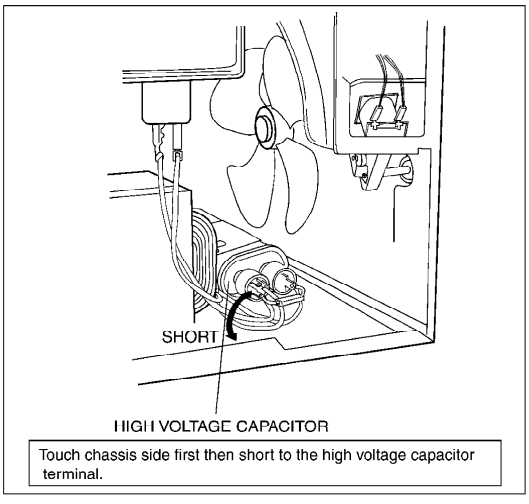
Do not operate on a 2-wire extension cord. The microwave oven is designed to be grounded when used. It is imperative, therefore, to make sure it is grounded properly before beginning repair work.

2.2. Warning about the electric charge in the high voltage capacitor

For about 30 seconds after the oven is turned off, an electric charge remains in the high voltage capacitor.When replacing or checking parts, remove the power plug from the outlet and short the terminal of the high voltage capacitor (terminal of lead wire from diode) to chassis ground with an insulated handle screwdriver to discharge.

WARNING
There is high-voltage present, with high-current capabilities in the circuits of the high voltage winding and filament winding of the high voltage transformer. It is extremely dangerous to work on or near these circuits with oven energized. / DO NOT measure the voltage in the high voltage circuit including filament voltage of magnetron.

WARNING
Never touch any circuit wiring with your hand nor with an insulated tool during operation.



Touch chassis side first then short to the high voltage capacitor terminal.

2.3. When parts must be replaced, remove the power plug from the outlet.

2.4. When the 8 Amp fuse is blown due to the operation of short switch:

WARNING

When the 8 Amp fuse is blown due to operation of the interlock monitor switch, you must replace all of the components (Primary latch switch, Door switch, Short switch and Power relay B (RY1)).

1. **This is mandatory. Refer to “Adjustments and Measurement” for these switches.**
2. **When replacing the fuse, confirm that it has the appropriate rating for these models.**
3. **When replacing faulty switches, be sure mounting tabs are not bent, broken or otherwise deficient in their ability to hold the switches.**

2.5. Avoid inserting nails, wire, etc. through any holes in the unit during operation.

Never insert a wire, nail or any other metal object through the lamp holes on the cavity or any other holes or gaps, because such objects may work as an antenna and cause microwave leakage.

2.6. Confirm after repair

1. **After repair or replacement of parts, make sure that the screws of the oven, etc. are neither loose nor missing. / Microwaves might leak if screws are not properly tightened.**
2. **Make sure that all electrical connections are tight before inserting the plug into the wall outlet.**
3. **Check for microwave energy leakage. (Refer to procedure for measuring microwave evergy leakage.)**

CAUTION / MICROWAVE RADIATION

USE CAUTION NOT TO BECOME EXPOSED TO RADIATION FROM THE MICROWAVE MAGNETRON OR OTHER PARTS CONDUCTING MICROWAVE ENERGY.

IMPORTANT NOTICE

1.The following components have potentials above 2000V while the appliance is operated.

*** Magnetron**

*** High voltage transformer**

*** High voltage diode**

*** High voltage capacitor**

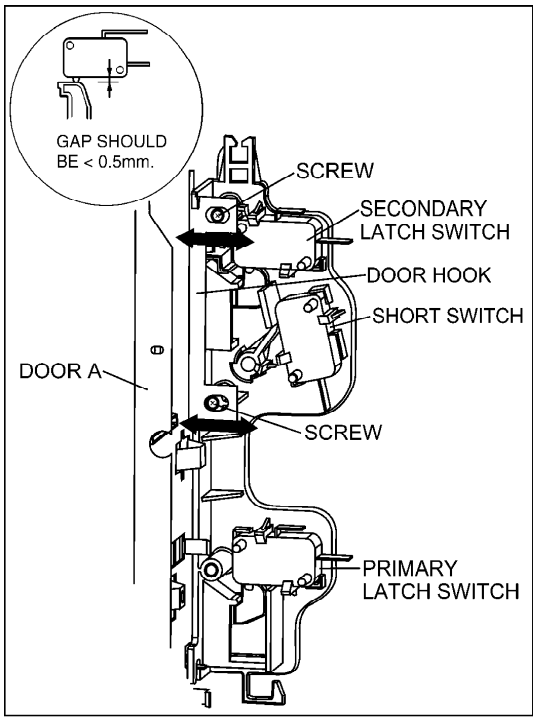
Pay special attention to these areas.

2.When the appliance is operated with the door hinge or magnetron adjusted incorrectly, the microwave leakage can exceed more than 5mW/cm^2. After repair or exchange, it is very important to check that magnetron and the door hinge is correctly installed.

3. MEASUREMENTS AND ADJUSTMENTS

3.1. Adjustment of Primary latch switch, Secondary latch switch and Short switch.

1. **Mount the Primary latch swith, the Secondary latch switch and the Short switch to the door hook assembly as shown in ILL.**
   NOTE:
   No specific individual adjustments during installation of the Primary latch switch, Secondary latch switch or Short switch to the door hook are required.
2. **When mounting the door hook assembly to the oven assembly, adjust the door hook assembly by moving it in the direction of the arrows in the illustration so that the oven door will not have any play in it. Check for play in the door by pulling the door assembly. Make sure that the latch keys move smoothly after adjustment is completed. Completely tighten the screws holding the door hook assembly to the oven assembly.**
3. **Reconnect the short switch and check the coninuity of the monitor circuit and all latch switches again by following the component test procedures.**



3.2. Measurement of microwave output

The output power of the magnetron can be determined by performing IEC standard test procedures. However, due to the complexity of IEC test procedures, it is recommended to test the magnetron using the simple method outlined below.

Necessary Equipment:

- **1 liter beaker**
- **Glass thermometer**
- **Wrist watch or stopwatch**

NOTE:

Check the line voltage under load.Low voltage will lower the magnetron output. Take the temperature readings and heating time as accurately as possible.

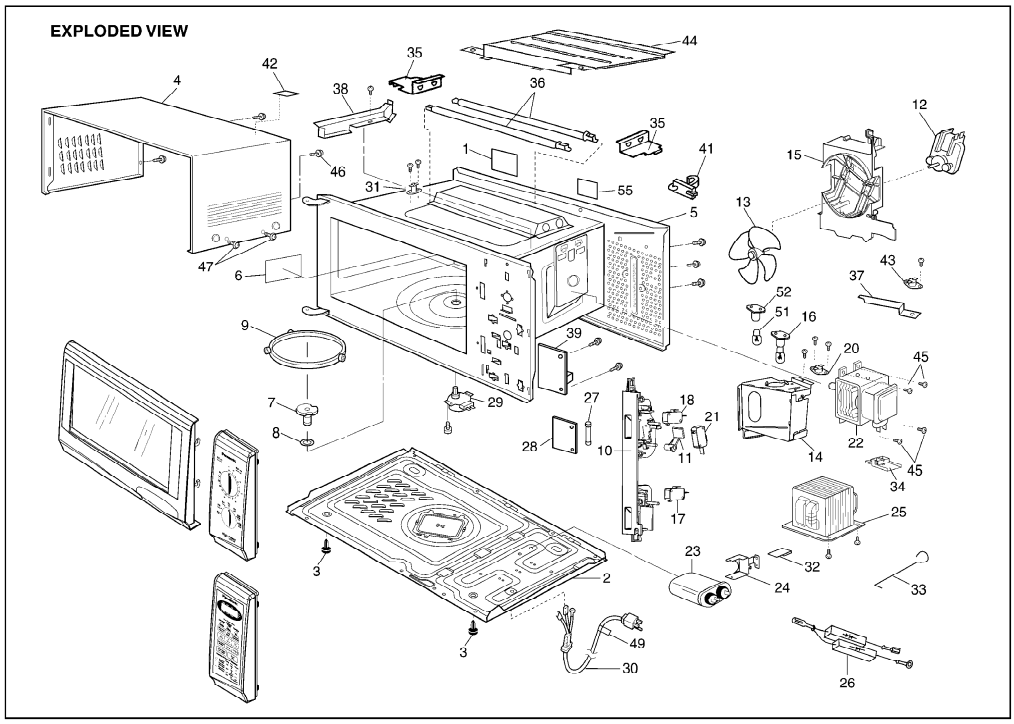
1. **Fill the beaker with exactly one liter of tap water. Stir the water using the thermometer and record the water's temperature. (recorded as T1).**
2. **Place the beaker on the center of glass tray. / Set the oven for High power and heat it for exactly one minute.**
3. **Stir the water again and read the temperature of the water. (recorded as T2).**
4. **The normal temperature rise at High power level for each model is as shown in table.**

TABLE (1L-1min.test)

RATED OUTPUT	TEMPERATURE RISE
800W	Min.12.6°F(7.0°C)

4. EXPLODED VIEW AND PARTS LIST

4.1. EXPLODED VIEW



4.2. PARTS LIST

NOTE:

1. When ordering replacement part(s), please use part number(s) shown in this part list.
Do not use description of the part.

2. Important safety notice:
Components identified by mark have special characteristics important for safety.
When replacing any of these components, use only manufacture's specified parts.

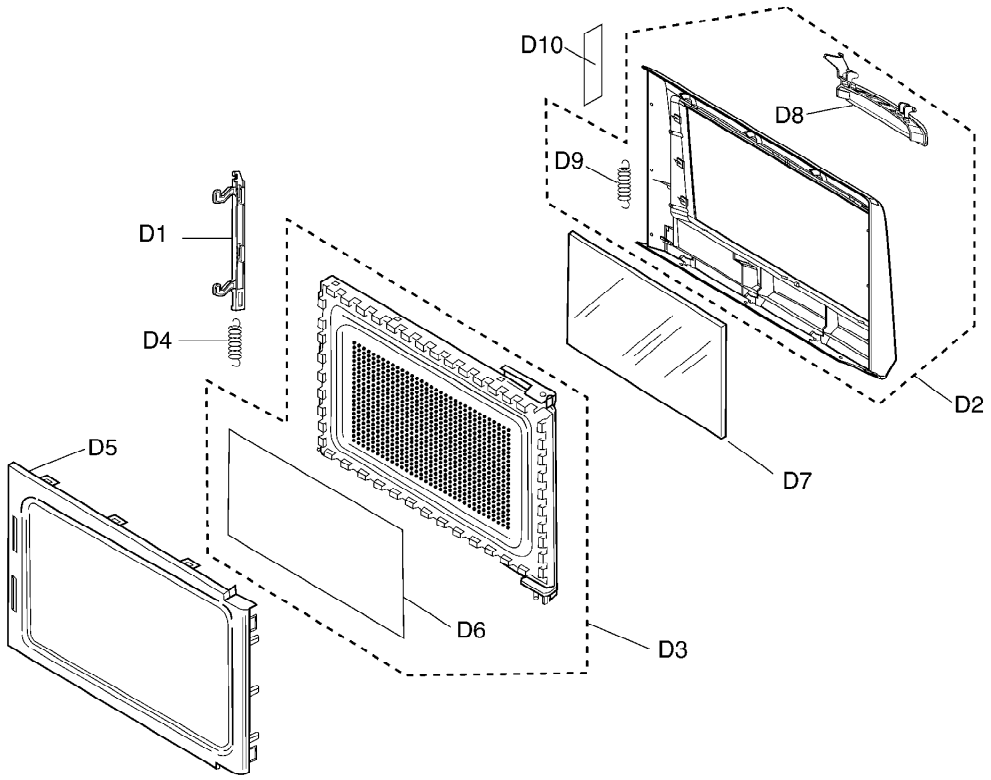
NOTE:

"A" parts are supplied by CSD (Japan)
"F" parts are supplied by PHAMOS (China)

Ref. No.		Part No.	Part Name & Description	Pcs/Set	Remarks
1		F01576R60HHP	NAME PLATE	1	G335WF HPE
1		F01576R60HYT	NAME PLATE	1	G335WF YTE
1		F01576R60HLP	NAME PLATE	1	G335WF LPK
1		F01576R60HKT	NAME PLATE	1	G335WF KTE
1		F01576R60HPT	NAME PLATE	1	G335WF PTE
1		F01576R60HZP	NAME PLATE	1	G335WF ZPE
1		F01576R60SZP	NAME PLATE	1	G335MF ZPE
1		F01576R60BZP	NAME PLATE	1	G335BF ZPE
1		F01576R50HZP	NAME PLATE	1	G315WF ZPE
2		F10016S10XP	BASE	1	
3		F10084T00AP	RUBBER FOOT	2	
4		F110D6N60HXP	CABINET BODY (U)	1	G335WF,G315WF
4		F110D6N60SXP	CABINET BODY (U)	1	G335MF
4		F110D6N60BXP	CABINET BODY (U)	1	G335BF
5	⚠	F200A6R60HP	OVEN (U)	1	EXCEPT ZPE
5	⚠	F200A6R60XP	OVEN (U)	1	G335*F ZPE
5	⚠	F200A6R50XP	OVEN (U)	1	G315WF ZPE
6		F20556S10XP	COVER	1	
7		F21316E70XP	PULLY SHAFT	1	
8		F2177-F80	WASHER	1	
9		F290D6S10XP	ROLLER RING (U)	1	
10	⚠	F30206S10XP	DOOR HOOK	1	
11		F31365Q00AP	HOOK LEVER A	1	
12		F400A6S10XP	FAN MOTOR	1	
13		F4008-1E60	FAN BLADE	1	
14		F40256S10XP	AIR GUIDE A	1	
15		F41446S10XP	ORIFICE	1	
16		F612E5G50XN	INCANDESCENT LAMP (U)	1	EXCEPT HPE
17	⚠	J61424T00AP	MICRO SWITCH	1	PRIMARY LATCH SWITCH
17	⚠	J61424T00AP	MICRO SWITCH	1	SECONDARY LATCH SWITCH (G315WF)
18	⚠	J61414T00AP	MICRO SWITCH	1	SECONDARY LATCH SWITCH (G335*F)
20	⚠	F61456S10XP	THERMAL CUTOUT	1	60°C ON ,180°C OFF (G315WF)
21	⚠	J61784T00AP	MICRO SWITCH	1	SHORT SWITCH
22	⚠	2M211A-M1J	MAGNETRON	1	
23	⚠	F60906N60XP	H.V.CAPACITOR	1	EXCEPT LPK
23	⚠	F6090-1H70	H.V.CAPACITOR	1	LPK
24		F60376S10XP	CAPACITOR BRACKET	1	
25	⚠	F621B6S10HP	H.V.TRANSFORMER	1	EXCEPT LPK
25	⚠	F621B6S10LP	H.V.TRANSFORMER	1	LPK
26	⚠	F605V6N60XP	DIODE (U)	1	
27	⚠	ANE6230Z70BP	FUSE	1	8A
28		F692Y6S10QP	NOISE FILTER (U)	1	G315WF ZPE
29		F63266S10XP	TURNTABLE MOTOR	1	
30	⚠	F900C6S20YT	AC CORD W/PLUG	1	HPE,YTE,KTE
30	⚠	F900C6S20AP	AC CORD W/PLUG	1	LPK
30	⚠	F900C6S10ZP	AC CORD W/PLUG	1	PTE,ZPE

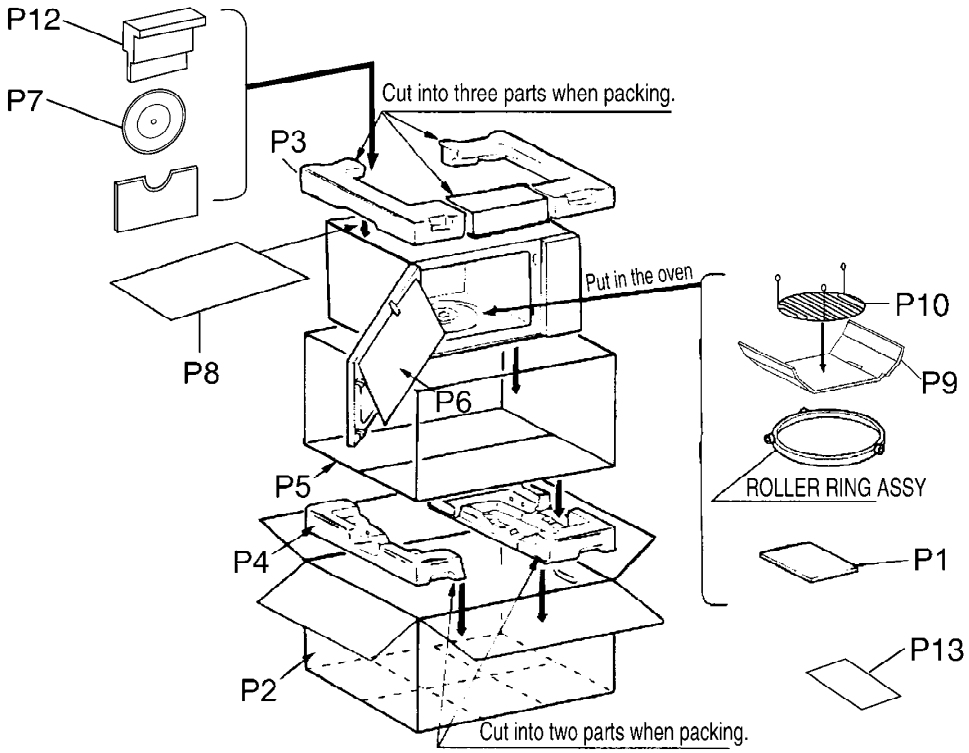
Ref. No.		Part No.	Part Name & Description	Pcs/Set	Remarks
31	⚠	F61456N00AP	THERMAL CUTOUT	1	-20°C ON ,120°C OFF
32		F60366S10XP	CAPACITOR INSTALLATION BRACKET	1	
33		F11656S10XP	REINFORCE BRACKET	1	G335*F
33		F11656R50XP	REINFORCE BRACKET	1	G315WF
34		F60706S10XP	INSULATE BRACKET	1	
35		F64605G50XN	HEATER MOUNTING PLATE	2	
36		F630G6B90XN	HEATER (AU)	2	
37		F66266R60XP	THERMAL CUTOUT MOUNTING	1	G335*F
37		F66265G50XN	THERMAL CUTOUT MOUNTING	1	G315WF
38		F40268920XN	AIR GUIDE B	1	
39		F603Y6R60XP	D.P.CIRCUIT (DU)	1	G335WF (HPE,YTE,LPK,KTE,PTE)
39		F603Y6R60ZP	D.P.CIRCUIT (DU)	1	G335*F (ZPE)
41		F11407000AP	STOPPER	1	
42		F01504Y00XN	NO TOUCHING LABEL	1	EXCEPT G335BF ZPE
42		F01506N60SXP	NO TOUCHING LABEL	1	G335BF ZPE
43	⚠	F61455G60XN	THERMAL CUTOUT	1	70°C ON,150°C OFF (G335*F)
43	⚠	F61455G50XN	THERMAL CUTOUT	1	67°C ON,77°C OFF (G315WF)
44		F22175G60AP	INSULATION PLATE	1	
45		XTWFA4+12T	SCREW	4	FOR MAGNETRON
46		XTWFA4+12D	SCREW	3	FOR CABINET BODY
47		XTTFA4+6BN	SCREW	2	FOR CABINET BODY SIDE
49		F02395E20KN	CORD CAUTION LABEL	1	KTE,PTE
51		F60305G60HN	INCANDESCENT LAMP	1	HPE
52		F61525H00AP	SOCKET	1	HPE
55		F00068100HN	CAUTION LABEL	1	EXCEPT ZPE
55		F00065E90ZP	CAUTION LABEL	1	ZPE

4.3. DOOR ASSEMBLY



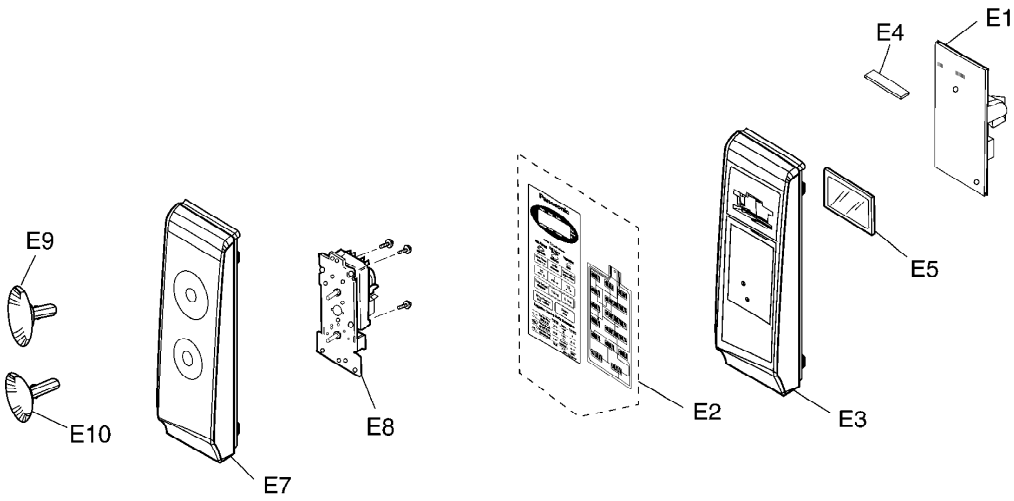
Ref. No.		Part No.	Part Name & Description	Pcs/Set	Remarks
D1		F30186S10XP	DOOR KEY A	1	
D2	⚠	F301A6S10HXP	DOOR A (U)	1	G335WF
D2	⚠	F301A6S10HAP	DOOR A (U)	1	G315WF
D2	⚠	F301A6S10SXP	DOOR A (U)	1	G335MF
D2	⚠	F301A6S10BAP	DOOR A (U)	1	G335BF
D3	⚠	F302K6S10XP	DOOR E (U)	1	
D4		F30216S10XP	DOOR KEY SPRING	1	
D5	⚠	F30856S10XP	DOOR C	1	
D6		F31455G10XN	DOOR SCREEN A	1	
D7		F31466S10XP	DOOR SCREEN B	1	
D8		F30126S10KXP	DOOR HANDLE	1	G335*F
D8		F30126S10HXP	DOOR HANDLE	1	G315WF
D9		F30216S10XP	HANDLE SPRING	1	
D10		F02459660AP	DHHS LABEL	1	LPK

4.4. PACKING AND ACCESSORIES



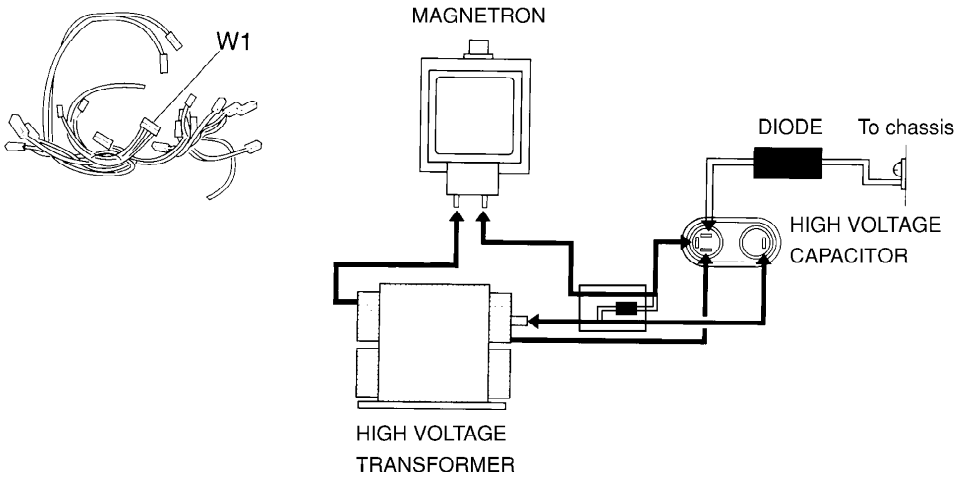
Ref. No.		Part No.	Part Name & Description	Pcs/Set	Remarks
P1		F00036R60HP	INSTRUCTION MANUAL	1	G335WF (HPE,YTE,LPK)
P1		F00036R60KP	INSTRUCTION MANUAL	1	G335WF (KTE,PTE)
P1		F00036R50ZP	INSTRUCTION MANUAL	1	G335WF/MF/BF (ZPE),G315WF (ZPE)
P2		F01026R60HHP	PACKING CASE,PAPER	1	G335WF (HPE,LPK)
P2		F01026R60HYT	PACKING CASE,PAPER	1	G335WF (YTE)
P2		F01026R60HKT	PACKING CASE,PAPER	1	G335WF (KTE,PTE)
P2		F01026R60HZP	PACKING CASE,PAPER	1	G335WF (ZPE)
P2		F01026R60SZP	PACKING CASE,PAPER	1	G335MF (ZPE)
P2		F01026R60BZP	PACKING CASE,PAPER	1	G335BF (ZPE)
P2		F01026R50HZP	PACKING CASE,PAPER	1	G315WF (ZPE)
P3		F01045G40XN	UPPER FILLER	1	
P4		F01056S10XP	LOWER FILLER	1	
P5		F01068100XN	P.E BAG	1	
P6		F01075G10XN	DOOR SHEET	1	
P7		A06015G10XN	COOKING TRAY	1	
P8		F01924T00AP	SHEET	1	G335MF/BF
P9		F01085G50XN	TRAY PACKING	1	
P10		F060V5G50XN	OVEN RACK	1	
P12		F01136E70XP	TRAY STYROL	1	
P13		F04456R60HKT	OVERLAY	1	G335WF (KTE,PTE)

4.5. ESCUTCHEON BASE ASSEMBLY



Ref. No.		Part No.	Part Name & Description	Pcs/Set	Remarks
E1		F603L6R60HP	D.P.CIRCUIT (AU)	1	G335WF(HPE,YTE)
E1		F603L6R60LP	D.P.CIRCUIT (AU)	1	G335WF (LPK)
E1		F603L6R60KT	D.P.CIRCUIT (AU)	1	G335WF (KTE,PTE)
E1		F603L6R60ZP	D.P.CIRCUIT (AU)	1	G335*F (ZPE)
E2		F630Y6R60HHP	MEMBRANE SWITCH (U)	1	G335WF (HPE,YTE,LPK)
E2		F630Y6R60HKT	MEMBRANE SWITCH (U)	1	G335WF (KTE,PTE)
E2		F630Y6R60HZP	MEMBRANE SWITCH (U)	1	G335WF (ZPE)
E2		F630Y6R60SZP	MEMBRANE SWITCH (U)	1	G335MF (ZPE)
E2		F630Y6R60BZP	MEMBRANE SWITCH (U)	1	G335BF (ZPE)
E3		F80346S20HXP	ESCUTCHEON BASE	1	G335WF
E3		F80346S20SXP	ESCUTCHEON BASE	1	G335MF
E3		F80346S20BXP	ESCUTCHEON BASE	1	G335BF
E4		F67006S20XP	RUBBER CONNECTOR	1	G335*F
E5		AEDDHJ6S20XP	DISPLAY	1	G335*F
E7		F80346R50HZP	ESCUTCHEON BASE	1	G315WF
E8		F60016R50XP	TIMER	1	G315WF
E9		F80206S10KXP	TIMER KNOB	1	G315WF
E10		F83926S10KXP	TIMER KNOB	1	G315WF

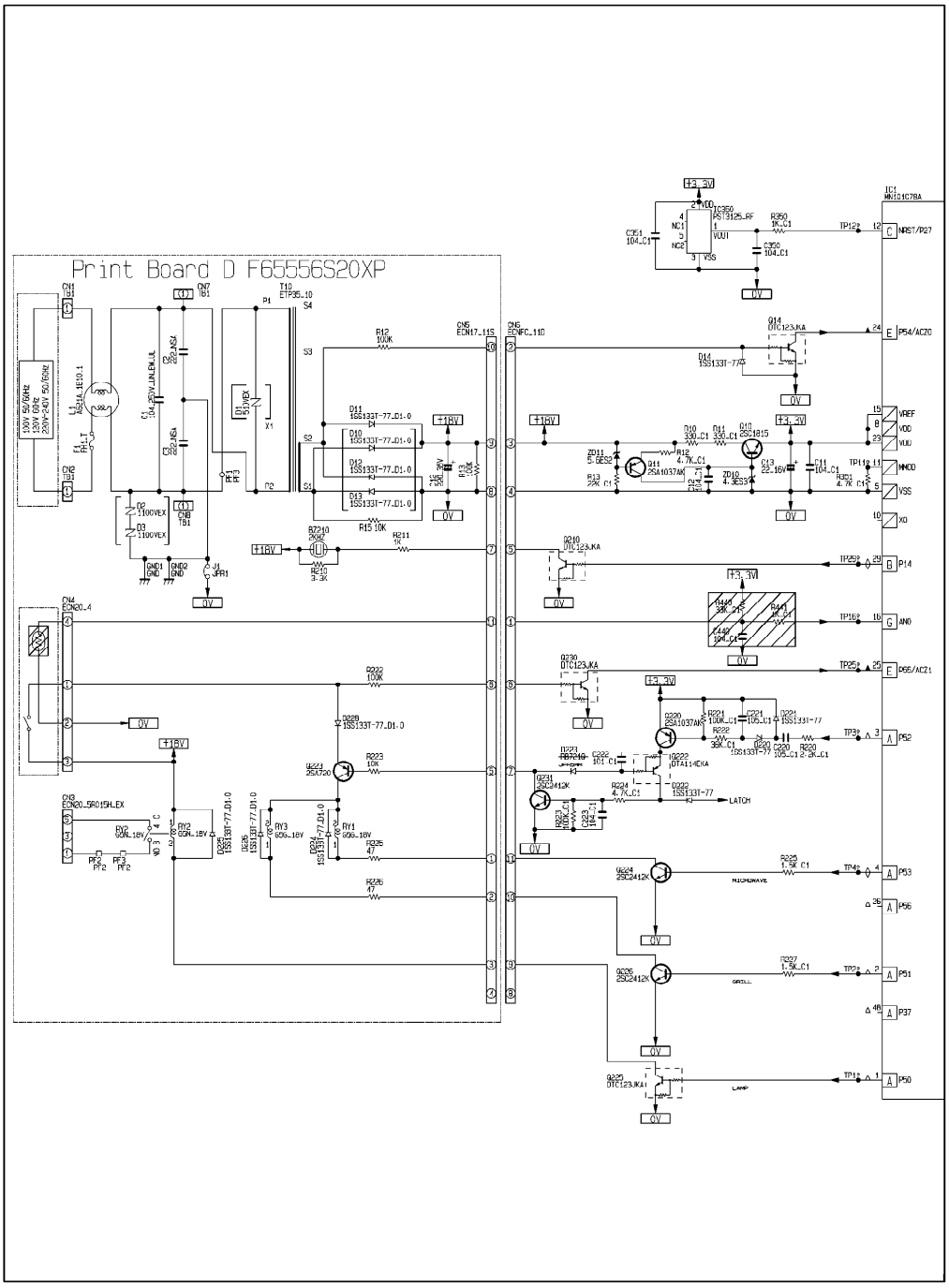
4.6. WIRING MATERIALS

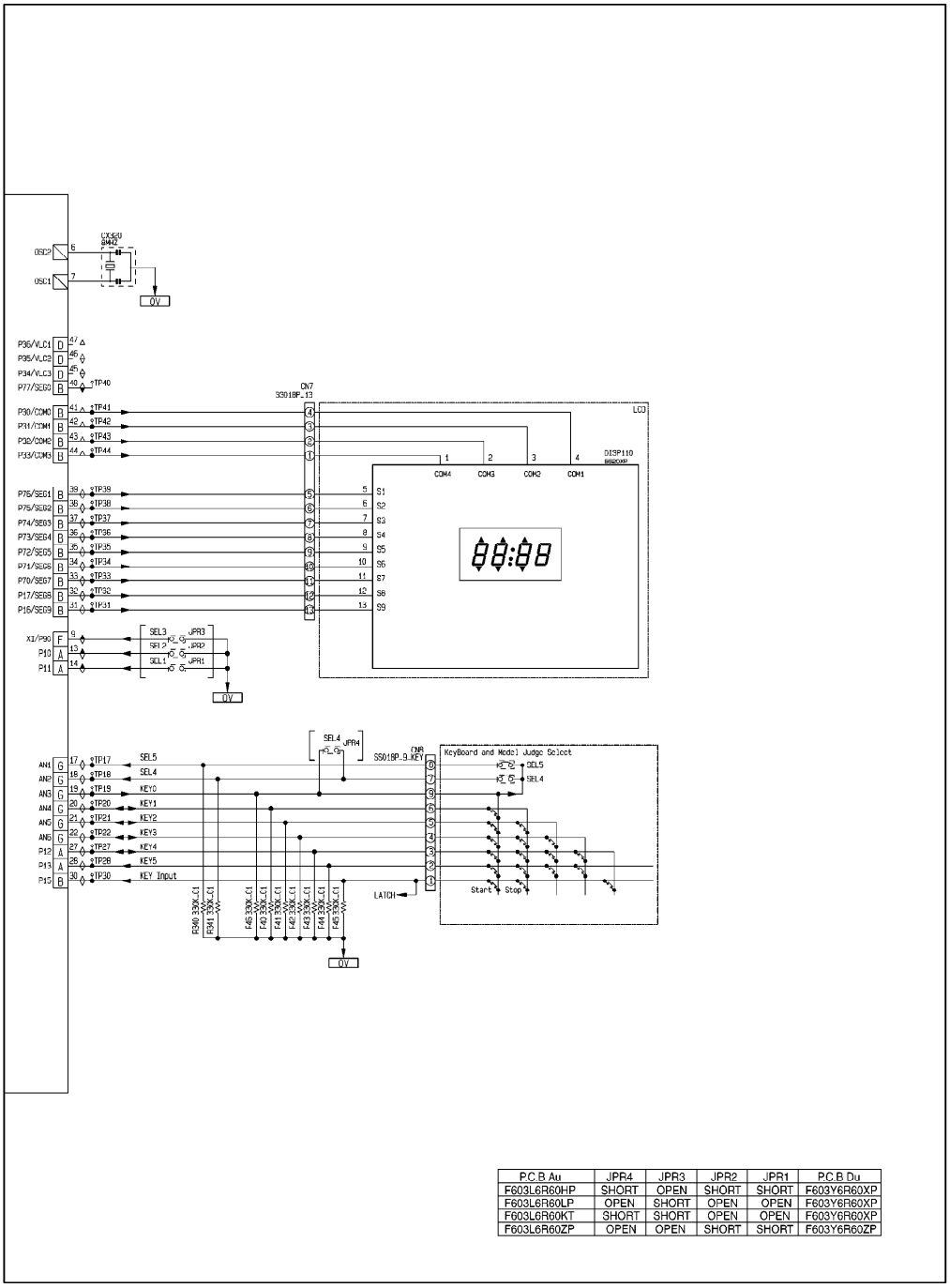


Ref. No.		Part No.	Part Name & Description	Pcs/Set	Remarks
W1		F030A6R60XP	LEAD WIRE HARNESS	1	G335*F
W1		F030A6R50ZP	LEAD WIRE HARNESS	1	G315WF

5. DIGITAL PROGRAMMER CIRCUIT(NN-G335WF/MF/BF)

5.1. SCHEMATIC DIAGRAM





P.C.B Au	JPR4	JPR3	JPR2	JPR1	P.C.B Du
F603L6R60HP	SHORT	OPEN	SHORT	SHORT	F603Y6R60XP
F603L6R60LP	OPEN	SHORT	OPEN	OPEN	F603Y6R60XP
F603L6R60KT	SHORT	SHORT	OPEN	OPEN	F603Y6R60XP
F603L6R60ZP	OPEN	OPEN	SHORT	SHORT	F603Y6R60ZP

5.2. PARTS LIST

Ref. No.	Part No.	Part Name & Description	Pcs/Set	Remarks
BZ210	AEFBAT2001WQ	BUZZER	1	2.0KHz
C12	AECETS1V220B	AL CHEM CAPACITOR	1	220 μ F/35V
C13	AECETS1C220B	AL CHEM CAPACITOR	1	22 μ F/16V
C1	ECQU2A474BP7	CAPACITOR	1	(G335*F ZPE)
C2,C3	ECTJ10222ME	CAPACITOR	2	0.0022 μ F/250V (G335*F ZPE)
C11,C12,C223,C350,C351	F1H1E104A108	CHIP CAPACITOR	5	0.1 μ F/25V
C220,C221	F1H1A105A068	CHIP CAPACITOR	2	1 μ F/10V
C222	F1H1H101A894	CHIP CAPACITOR	1	100PF/50V
CN1,CN2,CN7,CN8	F62146D00XN	CONNECTOR	4	
CN3	K1KA03AA0115	CONNECTOR	1	
CN4	F03536S20XP	LEAD WIRE HARNESS	1	
CN5	K1MN11A00008	CONNECTOR	1	
CN6	F65906S20XP	FLAT CABLE	1	
CX320	EFOEC8004A4	CERAMIC RESONATOR	1	8.00MHz
D10-D13,D14,D220-D223,D224-D226,D228	B0AACK000004	DIODE	13	
D1	AERZ511KSBN	VARISTOR	1	510V
D2,D3	AERZ102KSBN	VARISTOR	2	1000V
IC1	MN101C78ADG	L.S.I.	1	
IC350	COEBE0000401	IC	1	
Q10	B1BAAJ000003	TRANSISTOR	1	
Q11,Q220	B1ADCF000003	CHIP TRANSISTOR	2	
Q111,Q115,Q222,Q226,Q228	UNR211100L	CHIP DIGI-TRANSISTOR	5	
Q14,Q210,Q225,Q230	B1GBCFEL0002	CHIP DIGI-TRANSISTOR	4	
Q224,Q226,Q231	B1ABCF000010	CHIP TRANSISTOR	3	
Q223	B1ACGF000004	AUDION	1	
R350	AERJ06J102R	CHIP RESISTOR	1	1K Ω,1/10W,5%
R221,R223	AERJ06J104R	CHIP RESISTOR	2	100K Ω,1/10W,5%
R225,R227	AERJ06J152R	CHIP RESISTOR	2	1.5K Ω,1/10W,5%
R220	AERJ06J222R	CHIP RESISTOR	1	2.2K Ω,1/10W,5%
R13	AERJ06J223R	CHIP RESISTOR	1	22K Ω,1/10W,5%
R10,R11	AERJ06J331R	CHIP RESISTOR	2	330 Ω,1/10W,5%
R40-R46,R340,R341	AERJ06J334R	CHIP RESISTOR	9	330K Ω,1/10W,5%
R222	AERJ06J363R	CHIP RESISTOR	1	36K Ω,1/10W,5%
R12,R224,R351	AERJ06J472R	CHIP RESISTOR	3	4.7K Ω,1/10W,5%
R211	D0AF102JA155	CARBON RESISTOR	1	1K Ω,1/4W,5%
R15,R223	D0AF103JA155	CARBON RESISTOR	2	10K Ω,1/4W,5%
R12,R13,R222	D0AF104JA155	CARBON RESISTOR	3	100K Ω,1/4W,5%
R210	D0AF332JA155	CARBON RESISTOR	1	3.3K Ω,1/4W,5%
R225,R226	D0AF470JA155	CARBON RESISTOR	2	47 Ω,1/4W,5%
RY1,RY3	K6B1AGA00140	POWER RELAY	2	
RY2	K6B1AZA00011	POWER RELAY	1	
T10	AETP170-2301	LOW VOLTAGE TRANSFORMER	1	
ZD10	BOBA4R400002	ZENER DIODE	1	
ZD11	AESZMTZJ5R6B	ZENER DIODE	1	
F1	A62316010BP	FUSE HOLDER	2	

06/05 / S-6R5 / S-6R6 / Printed in China

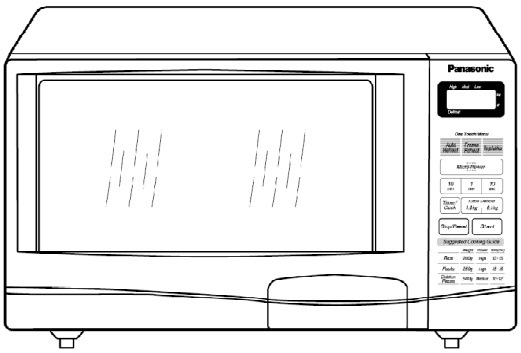
ORDER NO.PHAMOS0506021C3

Service Manual

Microwave Oven

NN-S215WF / NN-S215MF / NN-S235WF / NN-S235MF / NN-S235BF

QPQ(Australia & New Zealand)
HPE(Hong Kong)
YPQ(Singapore)
MPQ(Malaysia)
TPE(Thailand, Indonesia)
LPK(Philippines)
YTE(Others)
KTE(UAE)
PTE(Iran)
KPQ(Kuwait, Doha, Qatar, Oman, Bahrain, Pakistan)
STM(Saudi Arabia)
ZPE(CIS Countries)



SPECIFICATIONS

Specification

Model	S215WF/MF	S235WF/MF/BF
Power Source:	230VAC Single Phase,50Hz _ _ _ _ _ _ _ _ _ _ .For QPQ Models 240VAC Single Phase,50Hz _ _ _ _ _ _ _ _ _ _ .For KPQ, MPQ, YPQ Models 220VAC Single Phase,50Hz _ _ _ _ _ _ _ _ _ _ .For KTE, ZPE, HPE,TPE,YTE, PTE Models 220VAC Single Phase,50Hz/60Hz _ _ _ _ _ _ For STM Models 220-230VAC Single Phase,60Hz _ _ _ _ _ _ For LPK Models	
Power Requirement:	1200W(Except STM) 1100W(STM 50Hz) 1500W(STM 60Hz)	1200W(Except STM) 1100W(STM 50Hz) 1500W(STM 60Hz)
Output:	800W	800W
Microwave Frequency:	2450MHz	
Timer:	30min.	29min.90sec
Outside Dimensions:	364mm(D) x 482mm(W) x 284mm(H)	
Oven Cavity Dimensions:	330mm(D) x 325mm(W) x 218mm(H)	
Weight:	11.0kg	
PbF	This product with PbF	
Specifications subject to change without notice.		

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⚠ WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public. It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product.
Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

WARNING

1. This product should be serviced only by trained, qualified personnel.
2. Check for radiation leakage before and after every servicing according to the "procedure for measuring radiation leakage."
3. If the unit cannot be repaired on site, advise the customer not to use until unit is repaired.
4. There are special components used in the microwave oven which are important for safety. These parts are marked with a ⚠ on the replacement parts list. It is essential that these critical parts be replaced only with the manufacture's specified parts to prevent microwave leakage, shock, fire, or other hazards. Do not modify the orginal design.

This service manual covers products for following markets.
When troubleshooting or replacing parts, please refer to the country/area identifications shown below for your applicable product specification.

QPQ	For Australia & New Zealand
HPE	For Hongkong
TPE	For Thalland, Indonesia
YPQ	For Singapore
MPQ	For Malaysia
LPK	For Phillipines
YTE	For Others
ZPE	For CIS Countries
KTE	For UAE
PTE	For Iran
KPQ	For Kuwait, Doha, Qatar Oman, Bahrain, Pakistan
STM	For Saudi Arabia

CAUTION

About lead free solder (PbF)

Distinction of PbF PCB: PCBs (manufactured) using lead free solder will have a PbF stamp on the PCB.

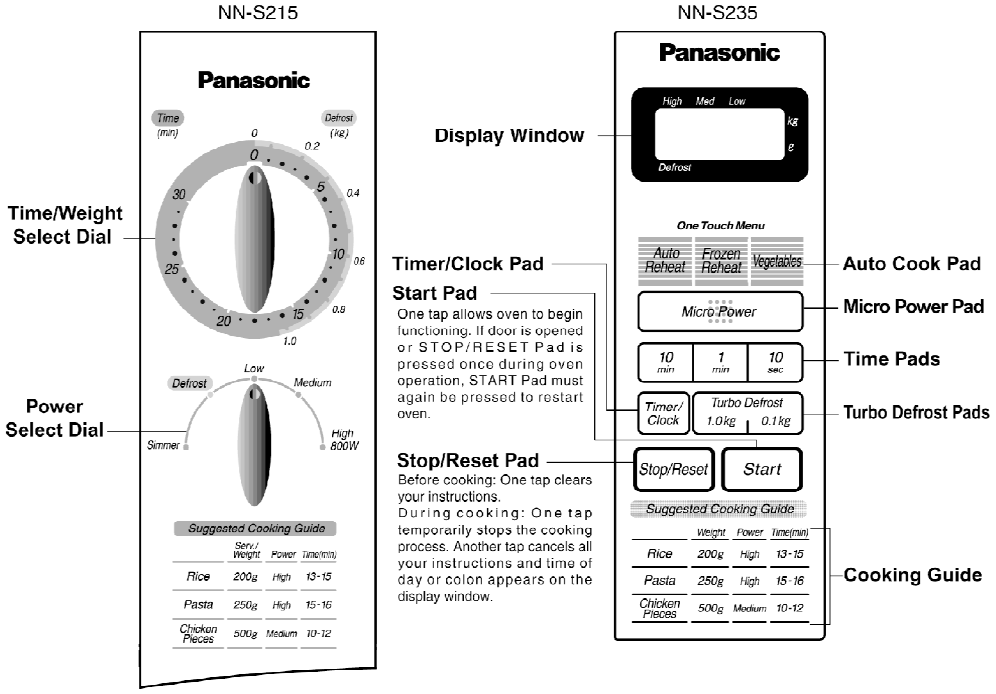
Caution:
- Pb free solder has a higher melting point than standard solder; Typically the melting point is 30 - 40˚C higher. Please use a high temperature soldering iron. In case of the soldering iron with temperature control, please set it to 370 ± 10˚C.
- Pb free solder will tend to splash when heated too high (about 600˚C).

Panasonic®

1. FEATURE CHART

MODEL / FEATURE	NN-S215WF/MF	NN-S235WF/M
Three Stage Cooking	—	O
Turbo Defrost	—	O
Auto Cook	—	O
Power Level Select	—	O
Variable Power Control	—	O
Child Safety Lock	O	—

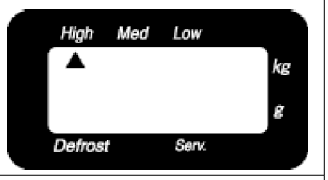
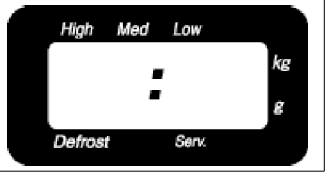
2. CONTROL PANEL


NN-S215
NN-S235
Panasonic
Time/Weight Select Dial
Power Select Dial
Display Window
Timer/Clock Pad
Start Pad
One tap allows oven to begin functioning. If door is opened or STOP/RESET Pad is pressed once during oven operation, START Pad must again be pressed to restart oven.
Stop/Reset Pad
Before cooking: One tap clears your instructions.
During cooking: One tap temporarily stops the cooking process. Another tap cancels all your instructions and time of day or colon appears on the display window.
Auto Cook Pad
Micro Power Pad
Time Pads
Turbo Defrost Pads
Cooking Guide
Suggested Cooking Guide
Rice 200g High 13-15
Pasta 250g High 15-16
Chicken Pieces 500g Medium 10-12

Pull Door Handle:
Pull to open the door. Opening the door during cooking will stop the cooking process without cancelling the program. Cooking resumes as soon as the door is closed. The oven light will turn on and stay on whenever the door is opened. It is quite safe to open the door at any time during a cooking program and there is no risk of microwave exposure.

3. OPERATION AND DIGITAL PROGRAMMER CIRCUIT TEST PROCEDURE

3.1. Time Cooking for Two Stage

OPERATION	SCROLL DISPLAY
1. Plug the power supply cord into wall outlet.	
2. Place a water load in the oven.	
3. Press [Micro Power] Pad once to set high power. **(1st stage)**	
4. Set for 10 Seconds.	
5. Press [Micro Power] Pad 5 times to set low power. **(2nd stage)**	
6. Set for 1 minute.	
7. Press [Start] Pad.	
7. When 1st stage cooking time has elapsed. Oven beeps twice and automatically switches to 2nd stage cooking.	
8. When 2nd stage cooking time has elapsed, oven beeps 5 times and shuts off.	

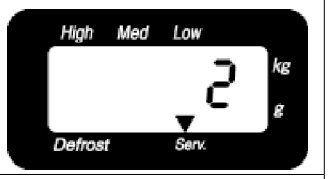
3.2. Turbo Defrost

OPERATION	SCROLL DISPLAY
1. Press [Turbo Defrost1.0 kg] Pad to set the weight for 1.0kg.	
2. Press [Start] pad.	
3. Press [Stop/Reset] Pad twice, Oven shuts off.	

3.3. Auto Cook

OPERATION	SCROLL DISPLAY
1. Press [Vegetables] pad thrice to set the weight for 300g.	
2. Press [Start] pad.	
3. When cooking time has elapsed, Oven beeps 5 times and shuts off.	

3.4. Auto Reheat

OPERATION	SCROLL DISPLAY
1. Press [Auto Reheat] pad twice for 2 serving.	
2. Press [Start] pad.	
3. When cooking time has elapsed, Oven beeps 5 times and shuts off.	

3.5. To Set Child Satety Lock

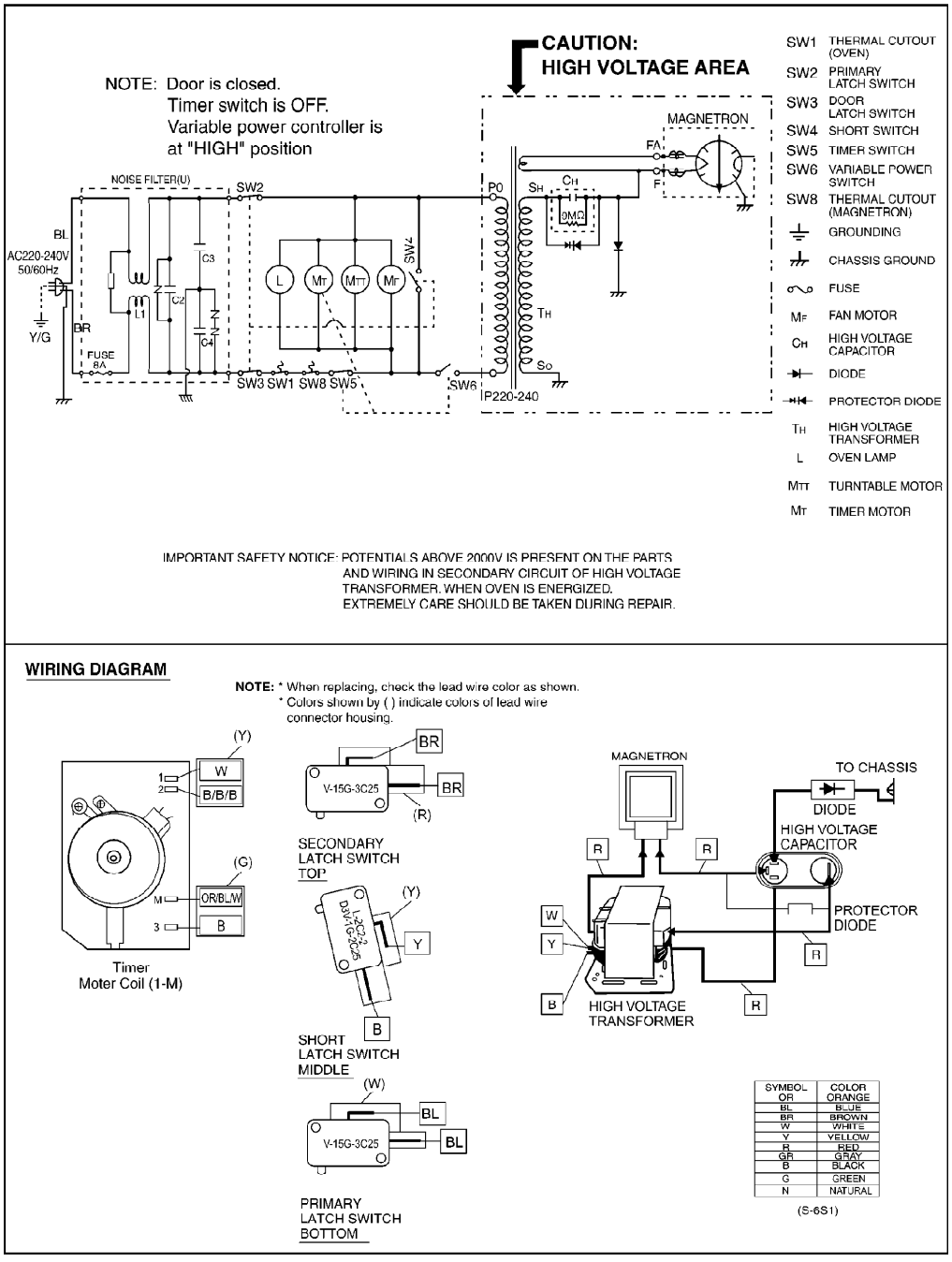
OPERATION	SCROLL DISPLAY
1. Press [Start] pad 3 times continuously. "Child" appears in the display.	

3.6. To Reset Child Lock

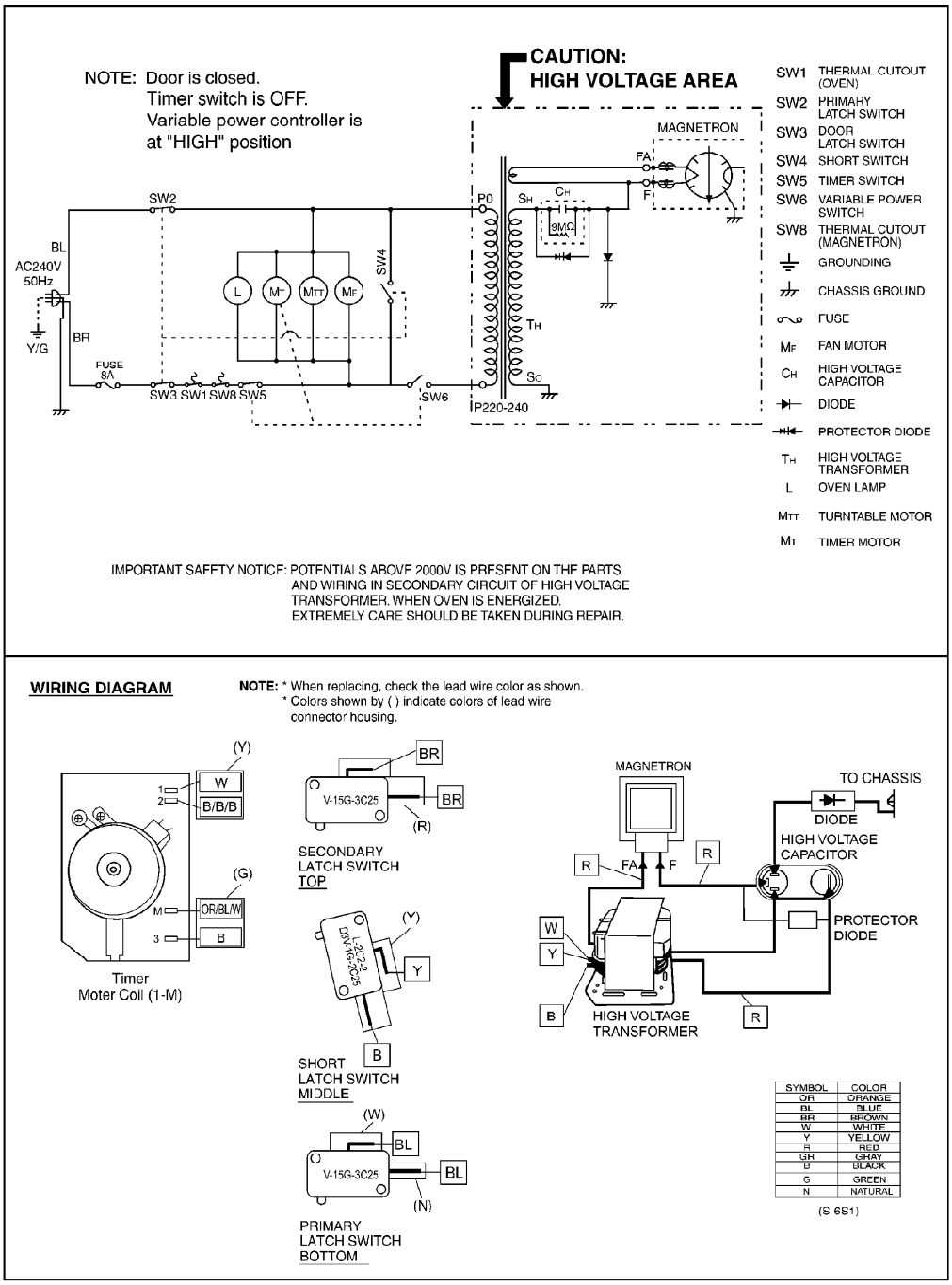
OPERATION	SCROLL DISPLAY
1. Press [Stop / Reset] pad 3 times continuously.	Time of day or colon if set appears in the display.

4. SCHEMATIC DIAGRAM

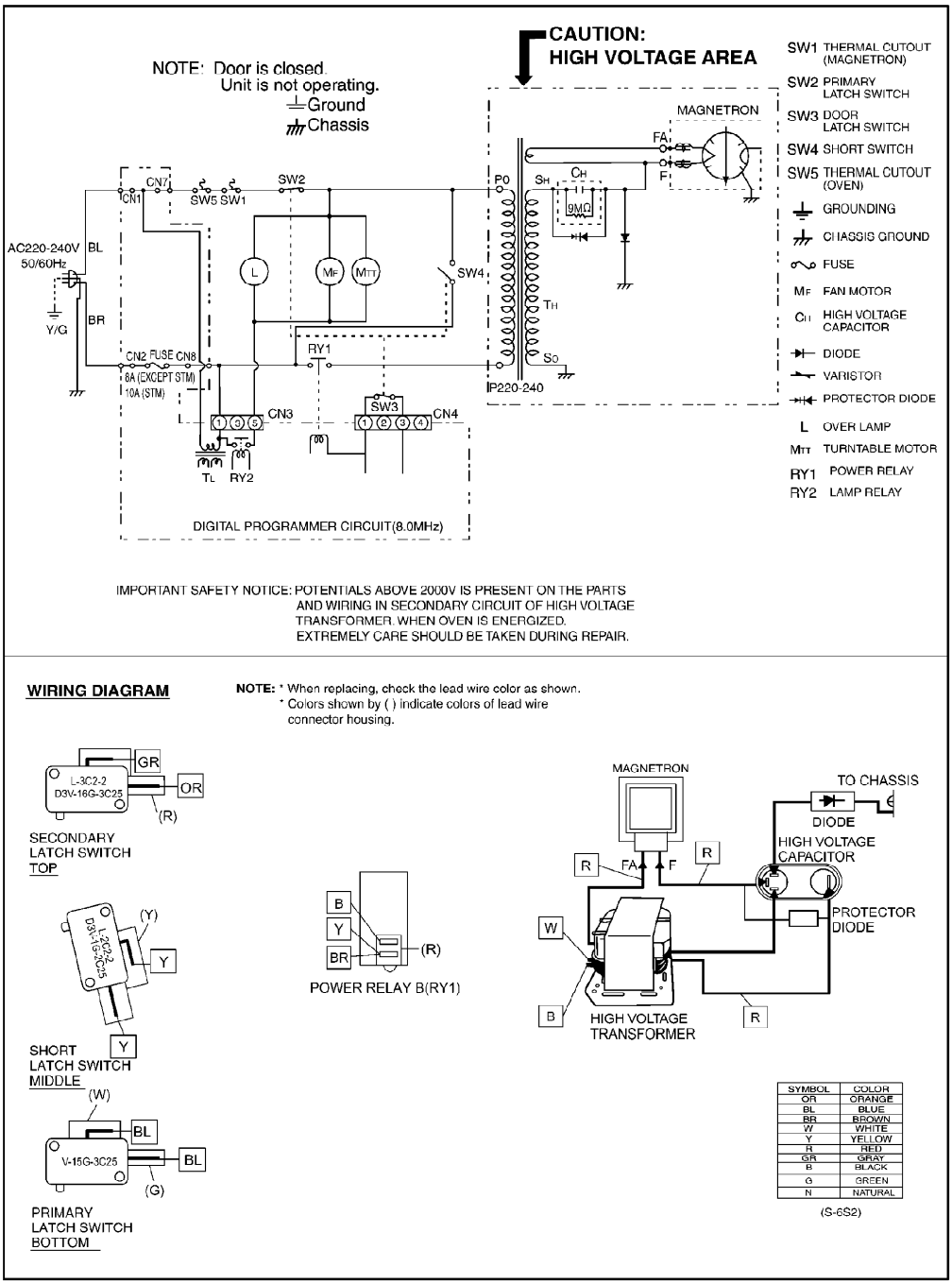
4.1. NN-S215 (QPQ, ZPE)



4.2. NN-S215 (EXCEPT QPQ & ZPE)


NOTE: Door is closed.
Timer switch is OFF.
Variable power controller is at "HIGH" position
CAUTION:
HIGH VOLTAGE AREA
MAGNETRON
SW2
BL
AC240V
50Hz
Y/G
BR
FUSE
8A
SW3 SW1 SW8 SW5
SW4
SW6
L
MT
MTT
MF
P0
SH
CH
9MΩ
FA
F
TH
SO
P220-240
SW1 THERMAL CUTOUT (OVEN)
SW2 PRIMARY LATCH SWITCH
SW3 DOOR LATCH SWITCH
SW4 SHORT SWITCH
SW5 TIMER SWITCH
SW6 VARIABLE POWER SWITCH
SW8 THERMAL CUTOUT (MAGNETRON)
GROUNDING
CHASSIS GROUND
FUSE
MF FAN MOTOR
CH HIGH VOLTAGE CAPACITOR
DIODE
PROTECTOR DIODE
TH HIGH VOLTAGE TRANSFORMER
L OVEN LAMP
MTT TURNTABLE MOTOR
MT TIMER MOTOR
IMPORTANT SAFETY NOTICE: POTENTIALS ABOVE 2000V IS PRESENT ON THE PARTS AND WIRING IN SECONDARY CIRCUIT OF HIGH VOLTAGE TRANSFORMER. WHEN OVEN IS ENERGIZED. EXTREMELY CARE SHOULD BE TAKEN DURING REPAIR.
WIRING DIAGRAM
NOTE: * When replacing, check the lead wire color as shown.
* Colors shown by ( ) indicate colors of lead wire connector housing.
(Y)
W
B/B/B
(G)
OR/BL/W
B
Timer
Moter Coil (1-M)
BR
V-15G-3C25
(R)
SECONDARY
LATCH SWITCH
TOP
(Y)
Y
B
SHORT
LATCH SWITCH
MIDDLE
(W)
BL
(N)
PRIMARY
LATCH SWITCH
BOTTOM
MAGNETRON
TO CHASSIS
DIODE
HIGH VOLTAGE
CAPACITOR
PROTECTOR
DIODE
HIGH VOLTAGE
TRANSFORMER
SYMBOL COLOR
OR ORANGE
BL BLUE
BR BROWN
W WHITE
Y YELLOW
R RED
GR GRAY
B BLACK
G GREEN
N NATURAL
(S-6S1)

4.3. NN-S235



5. DESCRIPTION OF OPERATING SEQUENCE

5.1. Variable power cooking control (NN-S235)

The coil of power relay B (RY1) is energized intermittently by the digital programmer circuit, when the oven is set at any power selection except for High power position. The digital programmer circuit controls the ON-OFF time of power relay B contacts in order to vary the output power of the microwave oven from ”Low” to “High” power. One complete ON and OFF cycle of power relay B is 22 seconds. The relation between indications on the control panel and the output of the microwave oven is as shown in table.

NOTE:

The ON/OFF time ratio does not correspond with the percentage of microwave power since approximately 2 seconds are required for heating of magnetron filament.

POWERSETTING	OUTPUT POWER(%) APPROX.	ON-OFF TIME OF POWER RELAY B (RY1)	
		ON(SEC)	OFF(SEC)
HIGH	100%	22	0
MEDIUM-HIGH	70%	17	5
MEDIUM	50%	13	9
MEDIUM-LOW	30%	8	14
LOW	15%	5	17
DEFROST	30%	8	14

5.2. Variable power cooking control (NN-S215)

The vari-power controller controls the ON-OFF time of the vari-power switch to vary the output power of the microwave oven from “Low” to “High”. The vari-power controller is a part of the timer assembly. The timer assembly consists of timer motor, timer switch, vari-power switch and the combination of gears, cam and actuater level.
One complete cycle of the vari-power controller is 30 senconds, in which the vari-power switch is turned “ON” or “OFF” by the cam rotation in the 30 ± 2 second period.
By controlling the timing of the vari-power switch “ON” period, the 220 or 240V AC supplied to the high voltage transformer is interrupted intermittently so that the average output power of the microwave oven is varied.
Table shows the timing chart of vari-power switch operation in response to the power setting on the control panel.

NOTE:
The ON/OFF time ratio does not correspond with the percentage of microwave power since approximately 2 seconds are required for heating of magnetron filament.

Variable Power Cooking

POWER SETTING	OUTPUT POWER(%) APPROX.	ON-OFF TIME OF POWER RELAY B (RY1)	
		ON(SEC)	OFF(SEC)
HIGH	100%	30	0
MEDIUM-HIGH	70%	23.2	6.8
MEDIUM	55%	16.5	13.5
MEDIUM-LOW	30%	9.8	20.2
LOW	15%	5	25
DEFROST	30%	9.8	20.2

5.3. Turbo Defrost, Auto Reheat, Auto Cook control (NN-S235)

When those Auto Control feature is selected and the Start Pad is tapped:

1. **The digital programmer circuit determines the power level and cooking time to complete cooking and indicates the operating state in the display window. / Table shows the corresponding cooking times for respective serving or weight by categories.**
2. **When cooking time in the display window has elapsed, the oven turns off automatically by a control signal from the digital programmer circuit.**

Turbo Defrost

WEIGHT SELECTED	COOKING TIME
1.0KG	9 min.36 sec.

Auto Reheat

WEIGHT SELECTED	COOKING TIME
2 SERV	3 min.10 sec.

Auto Cook

CATEGORY	WEIGHT SELECTED	COOKING TIME
Vegetable	100g	1 min.50 sec.

6. CAUTIONS TO BE OBSERVED WHEN TROUBLESHOOTING

Unlike many other appliances, the microwave oven is high-voltage, high-current equipment. Though it is free from danger in ordinary use, extreme care should be taken during repair.

CAUTION
Servicemen should remove their watches whenever working close to or replacing the magnetron.

6.1. Check the grounding

Do not operate on a 2-wire extension cord. The microwave oven is designed to be grounded when used. It is imperative, therefore, to make sure it is grounded properly before beginning repair work.

6.2. Warning about the electric charge in the high voltage capacitor

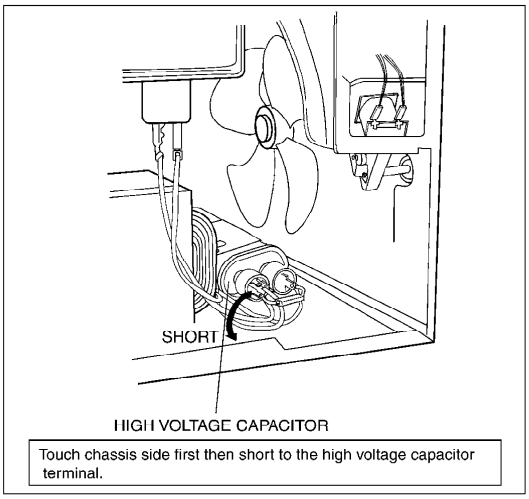
For about 30 seconds after the oven is turned off, an electric charge remains in the high voltage capacitor.When replacing or checking parts, remove the power plug from the outlet and short the terminal of the high voltage capacitor (terminal of lead wire from diode) to chassis ground with an insulated handle screwdriver to discharge.

WARNING

There is high-voltage present, with high-current capabilities in the circuits of the high voltage winding and filament winding of the high voltage transformer. It is extremely dangerous to work on or near these circuits with oven energized. / DO NOT measure the voltage in the high voltage circuit including filament voltage of magnetron.

WARNING

Never touch any circuit wiring with your hand nor with an insulated tool during operation.



Touch chassis side first then short to the high voltage capacitor terminal.

6.3. When parts must be replaced, remove the power plug from the outlet.

6.4. When the 8 Amp fuse is blown due to the operation of short switch:

WARNING

When the 8 Amp fuse is blown due to operation of the interlock monitor switch, you must replace all of the components (Primary latch switch, Door switch, Short switch and Power relay B (RY1)).

1. **This is mandatory. Refer to “Adjustments and Measurement” for these switches.**
2. **When replacing the fuse, confirm that it has the appropriate rating for these models.**

3. When replacing faulty switches, be sure mounting tabs are not bent, broken or otherwise deficient in their ability to hold the switches.

6.5. Avoid inserting nails, wire, etc. through any holes in the unit during operation.

Never insert a wire, nail or any other metal object through the lamp holes on the cavity or any other holes or gaps, because such objects may work as an antenna and cause microwave leakage.

6.6. Confirm after repair

1. After repair or replacement of parts, make sure that the screws of the oven, etc. are neither loose nor missing. / Microwaves might leak if screws are not properly tightened.
2. Make sure that all electrical connections are tight before inserting the plug into the wall outlet.
3. Check for microwave energy leakage. (Refer to procedure for measuring microwave evergy leakage.)

CAUTION / MICROWAVE RADIATION
USE CAUTION NOT TO BECOME EXPOSED TO RADIATION FROM THE MICROWAVE MAGNETRON OR OTHER PARTS CONDUCTING MICROWAVE ENERGY.

IMPORTANT NOTICE
1.The following components have potentials above 2000V while the appliance is operated. * Magnetron * High voltage transformer * High voltage diode * High voltage capacitor Pay special attention to these areas. 2.When the appliance is operated with the door hinge or magnetron adjusted incorrectly, the microwave leakage can exceed more than 5mW/cm^2. After repair or exchange, it is very important to check that magnetron and the door hinge is correctly installed.

7. DISASSEMBLY AND PARTS REPLACEMENT

PROCEDURE

7.1. Magnetron

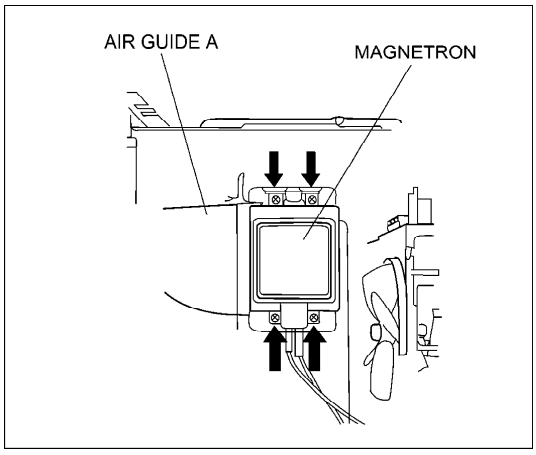
1. Discharge the high voltage capacitor.
2. Remove 1 screw holding air guide A & reinforce bracket.
3. Disconnect 2 high voltage lead wires from magnetron filament terminals.
4. Remove 4 screws holding the magnetron.

NOTE:

After replacement of the magnetron,tighten mounting screws properly in an X pattern, making sure there is no gap between the waveguide and the magnetron to prevent microwave leakage.

CAUTION
When replacing the magnetron, be sure the antenna gasket is in place.

CAUTION
When connecting 2 filament lead wires to the magnetron terminals, be sure to connect the lead wires in the correct position. The lead wire of high volatge transformer should be connected to “F terminal” and the lead wire from high voltage capacitor should be connected to “FA terminal”.



7.2. Digital Programmer Circuit (DPC) and membrane key board.

NOTE:

Be sure to ground any static electric charge built up on your body before handling the DPC.

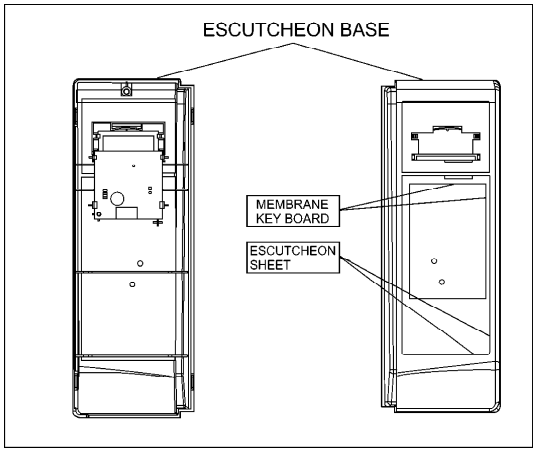
1. Release 1 flat cable from D.P.C board holding on the oven cavity.
2. Remove 1 screw holding escutcheon base and slide the escutcheon base upward slightly.
3. Remove 1 screws holding D.P.C board.
4. Separate D.P.C board from tabs on the escutcheon base and remove D.P.C board.
5. Remove rubber connector.
6. Separate display from tabs on the escutcheon base and remove display.

To replace membrane key board

7. Push the upper part of key board (display window portion) from back of escutcheon base, and peel off escutcheon sheet & membrane key board completely from escutcheon base.

NOTE:

1. The membrane key board is attached to the escutcheon base with double faced adhesive tape. Therefore, applying hot air such as using a hair dryer is recommended for smoother removal. / 2. When installing new membrane key board, make sure that the surface of escutcheon base is cleaned sufficiently so that any problems (shorted contacts or uneven surface) can be avoided. / 3. Alignment position of membrane key board is as follows; / Membrane key board: Right and upper edges / Escutcheon sheet: Right and upper edges

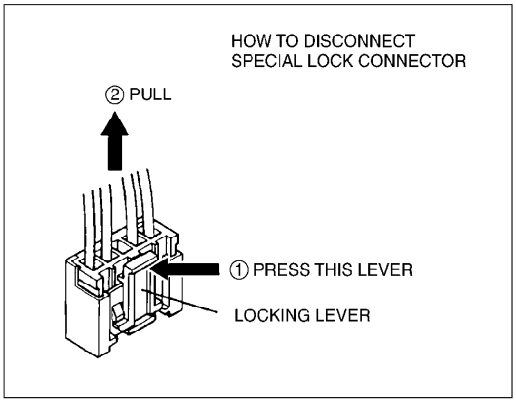


7.3. Low voltage transformer and/or power relays (RY1, RY2)

NOTE:

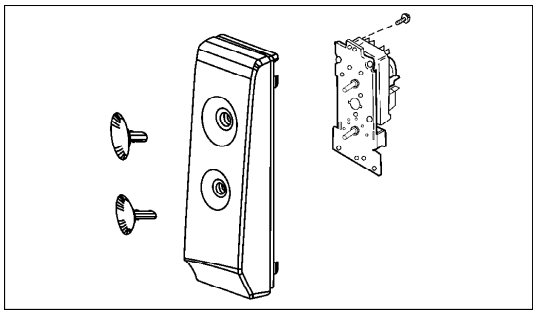
Be sure to ground any static electric charge built up on your body before handling the DPC.

1. **Disconnect all connectors from D.P.C..**
2. **Remove 2 screws holding D.P.C. board on the oven cavity.**
3. **Using solder wick or a desoldering tool and 30W soldering iron, carefully remove all solder from the terminal pins of the low voltage transformer and/or power relays.**
   NOTE:
   Do not use a soldering iron or desoldering tool of more than 30 watts on DPC contacts.
4. **With all the terminal pins cleaned and separated from DPC contacts, remove the defective transformer/power relays. Replace components, making sure all terminal pins are inserted completely. Resolder all terminal contacts carefully.**



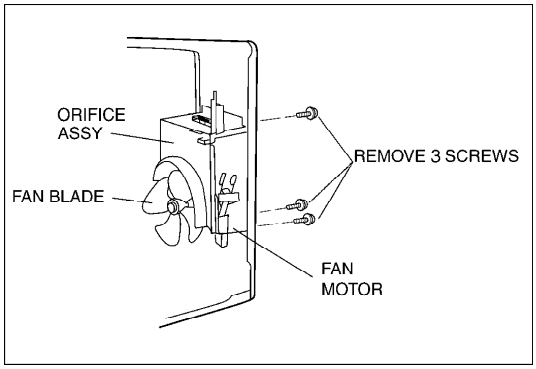
7.4. Timer

1. **Disconnect all lead wires from timer.**
2. **Remove 1 screw holding escutcheon base and slide the escutcheon base upward slightly.**
3. **Remove 3 screws to detach timer from escutcheon base.**
4. **Remove 2 knobs from timer shaft.**



7.5. Fan motor

1. Disconnect 2 lead wires from fan motor terminals.
2. Remove 1 screw holding diode (U) on side of the oven.
3. Disconnent 2 H.V. lead wires which linking to H.V. transformer from H.V. capacitor terminals.
4. Remove 3 screws holding orifice assy and detach the orifice assy from oven assy.
5. Remove fan blade from the motor shaft by pulling it straight out.
6. Remove 2 screws holding fan motor on orifice assy and detach the fan motor from orifice assy.



7.6. Door assembly

1. Remove door C from door E by carefully pulling outward starting from upper right hand corner using a flat blade screwdriver.
2. Separate door E from tabs on door A and remove door A.
3. Remove door screen B from door A.
4. Remove handle spring which hitching door handle, seperate door handle from door A by pulling outward door handle slightly, moving it towards the side of door A and out.

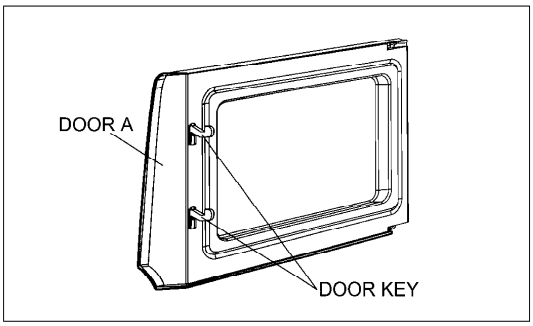
5. Open Door E at the opening angle of approximately 10°(Note: The door cannot be removed if the opening angle is greater than 10°).
6. Remove the door E from its hinges by pushing the door E's bottom upward and out.
7. Remove door key and door key spring from door E.
8. Replace other components.

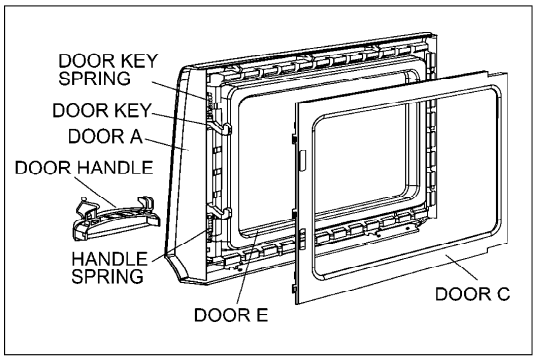
NOTE:

Door alignment is crucial. If door is misaligned, apply pressure until alignment is achieved.

NOTE:

After replacement of the defective component parts of the door, reassemble, and perform microwave leakage test.





7.7. Turntable motor

1. Remove the motor cover by breaking off at the 4 spots indicated by arrows with a cutter or the like.

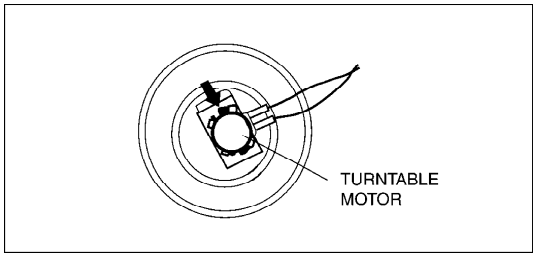
   NOTE:

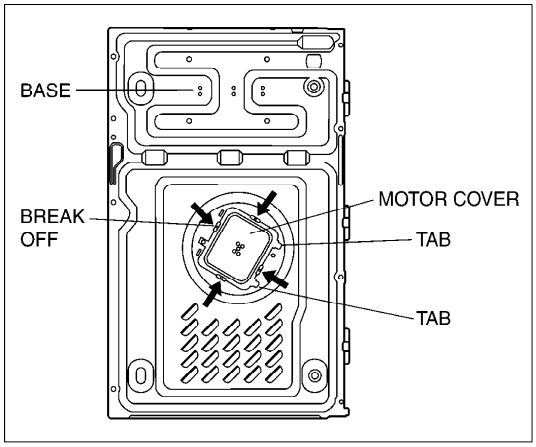
   After breaking off the motor cover, make sure that cut-off portions are properly trimmed off or bent to inside so that no sharp edges will be exposed to the outside.
2. Disconnect 2 lead wires connected to the turntable motor.

3. Remove the turntable motor by removing 1 screw.

NOTE:

After reinstalling the new turntable motor and reconnecting the 2 lead wires, reinstall the motor cover by rotating it around 180°, tucking the 2 tabs under the base into the 2 provided slots, then screw the single tab to the base using a screw.





8. COMPONENT TEST PROCEDURE

CAUTION
1. High voltage is present at the high voltage terminal of the high voltage transformer during any cook cycle.
2. It is neither necessary nor advisable to attempt measurement of the high voltage.
3. Before touching any oven components, or wiring, always unplug the oven from its power source and discharge the high voltage capacitor.

8.1. Primary Latch Switch, (Door Switch and Power Relay B) Interlocks.

1. Unplug the lead connectors to Power Relay B and verify continuity of the power relay B 1-2 terminals.

2. Unplug lead connectors to primary Latch switch and Door Switch.
3. Test the continuity of switches at door opened and closed positions with ohm meter (low scale). / Normal continuity readings should be as follows.

	Door Opened	Door Closed
Primary Latch Switch	∞ Ω (open)	0 Ω (close)
Door Switch	∞ Ω (open)	0 Ω (close)
Power Relay B	∞ Ω (open)	∞ Ω (open)

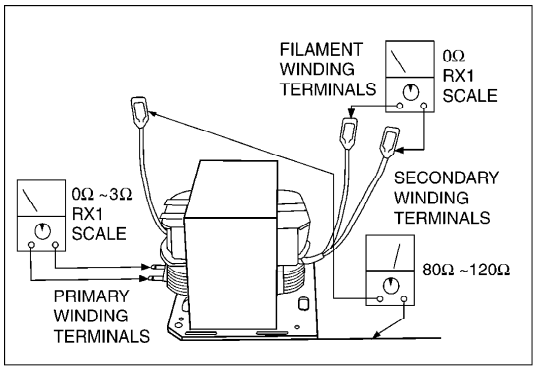
8.2. Short Switch & Monitor

1. Unplug lead wires from H.V.transformer primary terminals.
2. Connect test probes of ohm meter to the disconnected leads of the H.V. Transformer.
3. Test the continuity of short switch with door opened and closed positions using lowest scale of the ohm meter. / Normal continuity readings should be as follows.

Door Opened	Door Closed
0 Ω	∞ Ω

8.3. High voltage transformer

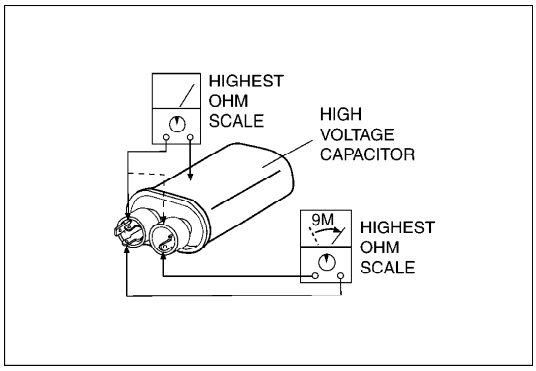
1. Remove connectors from the transformer terminals and check continuity.
2. Normal (cold) resistance readings should be as follows: / Secondary winding..... Approx. 80 Ω ~120 Ω / Filament winding..... Approx. 0 Ω / Primary winding..... Approx. 0 Ω ~1 Ω



8.4. High voltage capacitor

1. Check continuity of capacitor with meter on highest OHM scale.

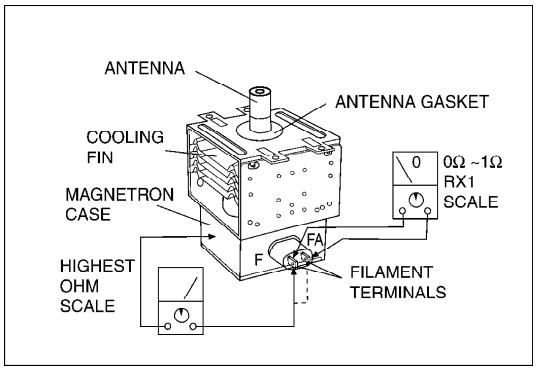
2. A normal capacitor will show continuity for a short time, and then indicate 9M Ω once the capacitor is charged.
3. A shorted capacitor will show continuous continuity.
4. An open capacitor will show constant 9M Ω .
5. Resistance between each terminal and chassis should be infinite.



8.5. Magnetron

Continuity checks can only indicate an open filament or a shorted magnetron. To diagnose for an open filament or shorted magnetron:

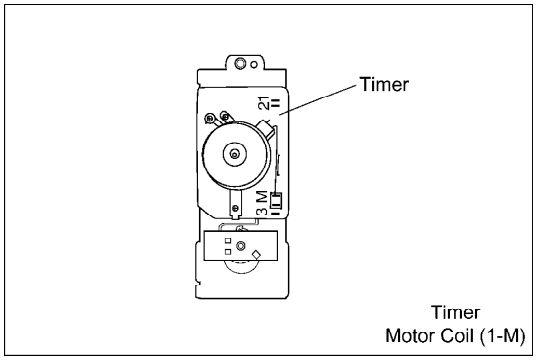
1. Isolate magnetron from the circuit by disconnecting the leads.
2. A continuity check across magnetron filament terminals should indicate one ohm or less.
3. A continuity check between each filament terminal and magnetron case should read open.



8.6. Variable power controller

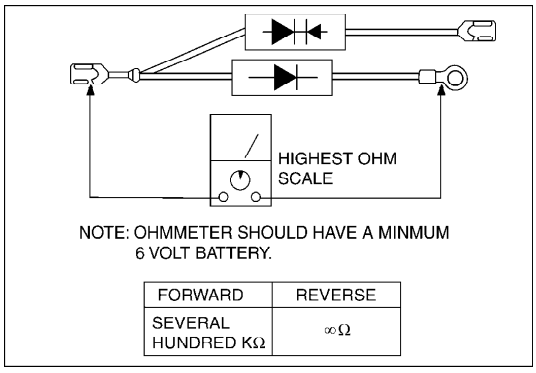
- Isolate variable power switch from the circuit by disconnected 2 leads.
- In order to check if variable power controllor is operating normally, follow the test procedures below.

1. **Select any power other than “High“ and start the oven.**
2. **Check continuity between both terminals of the variable power switch.**
3. **Variable power controller (timer and variable power switch) is working proporty it the ohm meter reads open and 0 Ω within 30 ± 2 seconds interval as shown in table on P.9.**



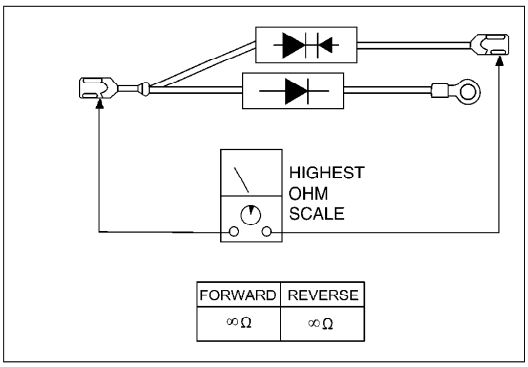
8.7. Diode (U)

1. **Isolate the diode (U) from the circuit by disconnecting the leads.**
2. **With the ohmmeter set on the highest resistance scale, measure the resistance across the diode terminals.Reverse the meter leads and again observe the resistance reading.Meter with 6V, 9V or higher voltage batteries should be used to check the front-to-back resistance of the diode, otherwise an infinite resistance may be read in both directions. / A normal diode’s resistance will be infinite in one direction and several hundred K Ω in the other direction.**



3. **With the ohmmeter set on the highest resistance scale, measure the resistance across the protector diode terminals. Reverse the meter leads and again observe the resistance reading.**
   A normal protector diode’s resistance will be infinite in both

directions. It is faulty if it shows continuity in one or both directions.



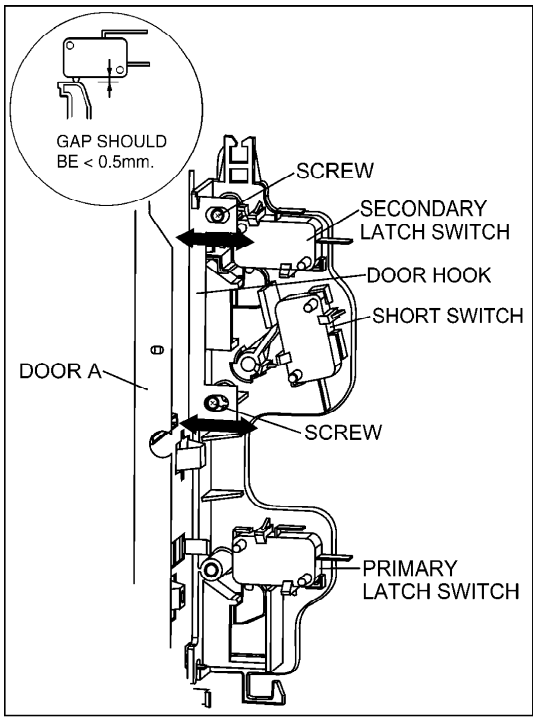
8.8. Membrane key board (Membrane switch assembly)

Check continuity between switch terminals, by tapping an appropriate pad on the key board. The contacts assignment of the respective pads on the key board is as shown in digital programmer circuit.

9. MEASUREMENTS AND ADJUSTMENTS

9.1. Adjustment of Primary latch switch, Secondary latch switch and Short switch.

1. **Mount the Primary latch swith, the Secondary latch switch and the Short switch to the door hook assembly as shown in ILL.**
   NOTE:
   No specific individual adjustments during installation of the Primary latch switch, Secondary latch switch or Short switch to the door hook are required.
2. **When mounting the door hook assembly to the oven assembly, adjust the door hook assembly by moving it in the direction of the arrows in the illustration so that the oven door will not have any play in it. Check for play in the door by pulling the door assembly. Make sure that the latch keys move smoothly after adjustment is completed. Completely tighten the screws holding the door hook assembly to the oven assembly.**
3. **Reconnect the short switch and check the coninuity of the monitor circuit and all latch switches again by following the component test procedures.**



9.2. Measurement of microwave output

The output power of the magnetron can be determined by performing IEC standard test procedures. However, due to the complexity of IEC test procedures, it is recommended to test the magnetron using the simple method outlined below.

Necessary Equipment:

- **1 liter beaker**
- **Glass thermometer**
- **Wrist watch or stopwatch**

NOTE:

Check the line voltage under load.Low voltage will lower the magnetron output. Take the temperature readings and heating time as accurately as possible.

1. **Fill the beaker with exactly one liter of tap water. Stir the water using the thermometer and record the water's temperature. (recorded as T1).**
2. **Place the beaker on the center of glass tray. / Set the oven for High power and heat it for exactly one minute.**
3. **Stir the water again and read the temperature of the water. (recorded as T2).**
4. **The normal temperature rise at High power level for each model is as shown in table.**

TABLE (1L-1min.test)

RATED OUTPUT	TEMPERATURE RISE
800W	Min.12.6°F(7.0°C)

10. TROUBLESHOOTING GUIDE

CAUTION

1. Check grounding before checking for trouble.

2. Be careful of high voltage circuit.

3. Discharge high voltage capacitor.

4. When checking the continuity of the switches or the high voltage transformer,disconnect one le from these parts and then check continuity with the AC plug removed. To do otherwise may result reading or damage to your meter. / When disconnecting a plastic connector from a terminal, you n the plastic connector instead of the lead wire and then disconnect it, otherwise lead wire may be d or the connector cannot be removed.

5. Do not touch any parts of the circuitry on the digital programmer circuit, since static electric dis may damage this control panel. / Always touch yourself to ground while working on this panel to d any static charge in your body.

6. 240V AC is present on the digital programmer circuit (Terminals of power relay's and primary ci low voltage transformer). When troubleshooting, be cautious of possible electrical shock hazard.

First of all operate the microwave oven following the correct operating procedures in order to find the exact cause of any trouble.

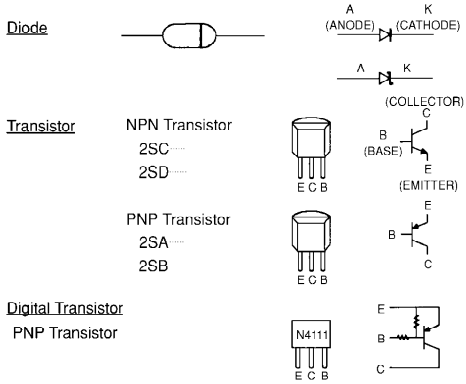
	SYMPTOM	CAUSE	CORRECTIONS
1.	Oven is dead. Fuse is OK. No display and no operation at all.	1. Open or loose lead wire harness 2. Open thermal cutout 3. Open low voltage transformer 4. Defective DPC	Check fan motor if thermal cutout is defective.
2.	No display and no operation at all. Fuse is blown.	1. Shorted lead wire harness 2. Defective primary latch switch (NOTE 1) 3. Defective short switch (NOTE 1) 4. Shorted H.V. capacitor 5. Shorted H.V. transformer (NOTE 2) 6. Shorted diode (U)	Check adjustment of primary, secondary latch switch and short switch including door.
		NOTE 1: All of these switches must be replaced at the same time. Check continuity of power relay B (RY1)'s contacts (between 1 and 2) and if it has continuity replace power relay B (RY1) also. NOTE 2: When H.V. transformer is replaced, check diode and magnetron also.	
3.	Oven does not accept key input(Program)	1. Key input is not proper in-sequence 2. Open or loose connection of membrane key pad to DPC (Flat cable or rubber connector) 3. Shorted or open membrane key board 4. Defective DPC	Refer to operation procedure. Refer to DPC troubleshooting.
4.	Fan motor turn on when oven is plugged in with door closed.	1. Misadjustment or loose wiring of secondary latch switch 2. Defective secondary latch switch	Adjust door and latch switches.
5.	Timer starts count down but no microwave oscillation. (No heat while oven lamp and fan motor turn on)	1. Off-alignment of latch switches 2. Open or loose connection of high voltage circuit especially magnetron filament circuit NOTE: Large contact resistance will cause lower magnetron filament voltage and cause magnetron to lower output and/or be intermittent. 3. Defective high voltage component H.V. transformer H.V. capacitor H.V. diode (U) Magnetron 4. Open or loose wiring of power relay B (RY1) 5. Defective primary latch switch 6. Defective DPC or power relay B (RY1)	Adjust door and latch switches. Check high voltage component according to component test procedure and replace if it is defective. Refer to DPC troubleshooting
6.	Oven can program but timer does not start countdown.	1. Open or loose wiring of secondary latch switch 2. Off-alignment of secondary latch switch 3. Defective secondary latch switch	Adjust door and latch switches.
7.	Microwave output is low. Oven takes longer time to cook food.	1. Decrease in power source voltage 2. Open or loose wiring of magnetron filament circuit. (Intermittent oscillation) 3. Aging change of magnetron	Consult electrician
8.	Fan motor turns on and turntable rotates when door is opened.	1. Shorted primary latch switch.	

	SYMPTOM	CAUSE	CORRECTIONS
9.	Oven does not operate and return to plugged in mode as soon as start pad is pressed.	1. Defective DPC	Check the grounding lead wire and D.P.C. board.
10.	Loud buzzing noise can be heard.	1. Loose fan and fan motor 2. Loose screws on H.V. transformer	
11.	Turntable motor does not rotate.	1. Open or loose wiring of turntable motor 2. Defective turntable motor	
12.	Oven stops operation during cooking.	1. Open or loose wiring of primary and secondary latch switch 2. Operation of thermal cutout	Adjust door and latch switches.
13.	15A fuse is blown.	1. Shorted lead wire harness 2. Defective short switch 3. Defective primary latch switdh 4. Shorted H.V. capacitor 5. Shorted H.V. diode 6. Defective magnetron 7. Shorted H.V. transformer 8. Shorted diode (U) 9. Defective power relays 10.Defective DPC	Check adjustment of latch switches and door Replace H.V. Diode and protector diode (*NOTE) Replace Magnetron and protector diode (*NOTE) Replace H.V. Transformer and protector diode (*NOTE)
		NOTE : Be sure to replace protector diode together with those H.V. components. In this case, only D2 of protector diode may be shorted due to faulty H.V. component. Therefore, if protector diode is not replaced together, high voltage transformer will be damaged (over heated).	

10.1. Trouble related to Digital Programmer Circuit

SYMPTOM	STEP	CHECK	RESULT	CAUSE/CORRECTIONS
No display when oven is first plugged in	1	Fuse pattern of DPC	Normal	→ STEP2
			Open(NOTE)	Shorted circuit of ZNR, L.V.T,Oven Lamp etc. Replace DPC
	2	Low voltage transformer (LVT) secondary voltage	Abnormal 0V	LVT
			Normal	→ Step3
	3	IC-1 pin 23 voltage (Emitter of Q10)	Abnormal	ZD10,Q10
			Normal=3.3V	IC1,CX320 Display
NOTE Procedure of fuse pattern repairing is as follows: 1. When the fuse pattern (PF2) opens. (1) Remove jumper wire (PF1). (2) Insert the removed jumper wire (PF1) to "(PF2)"position and solder it. If both "PF1" and "PF2" fuse patterns are open, please replace DPC. 2. When the fuse pattern (PF4) opens. (1) Remove jumper wire (PF3). (2) Insert the removed jumper wire (PF3) to "(PF4)" position and solder it. If both "PF3" and "PF4" fuse patterns are open, please replace DPC. NOTE:*At the time of these repairs, made visual inspection of the varistor for burning damage and examine the transformer with tester for the presence of layer short-circuit (check primary coil resistance). If any abnormal condition is detected, replace the defective parts.				
No key input	1	Membrane switch continuity	Abnormal	Membrane switch
			Normal	IC-1
No beep sound	1	IC-1 pin 29 voltage	Abnormal	IC-1
			Normal	BZ210, Q210
Power relay A(RY-2) does not turn on even though the program had been set and the start pad in tapped	1	IC-1 pin 1 voltage while operation	Abnormal	IC-1
			Normal=5V	→ Step 2
	2	Short circuit between collector and Emitter of Q225	Still not turn on	RY-2
			RY-2 turns on	Q225
No microwave oscillation at any power	1	IC-1 pin 4 voltages while operation at high power	Abnormal	IC-1
			Normal=5V	→ Step 2
	2	Transistor Q223 & Q224	Abnormal	Q223 and (or) Q224
			Normal	RY-1
Dark or unclear display	1	Replace display and check operation	Normal	DISPLAY
			Abnormal	IC-1
Missing or lighting of unnecessary segment	1	Replace IC-1 and check operation	Normal	IC-1
			Abnormal	DISPLAY

10.2. How To CHECK THE SEMICONDUCTORS USING AN OHM METER



	FORWARD	REVERSE
A-K	SMALL	∞

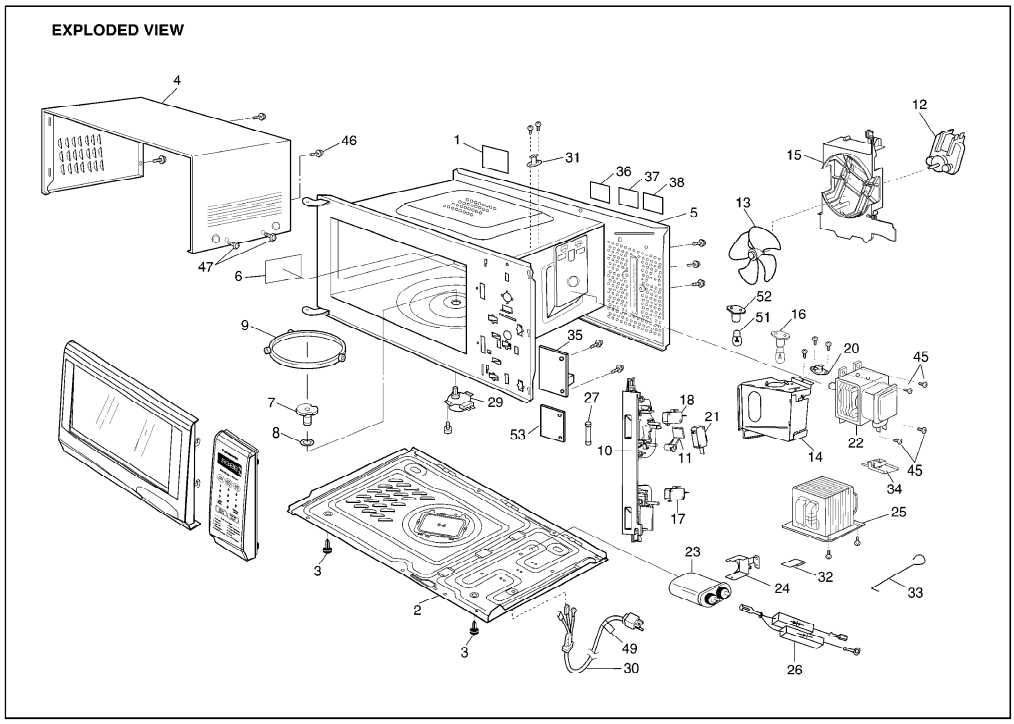
	FORWARD	REVERSE
B-E	SMALL	∞
B C	SMALL	∞
C-E	∞	∞

	FORWARD	REVERSE
E-B	SMALL	∞
C-B	SMALL	∞
C-E	∞	∞

	FORWARD	REVERSE
E-B	10kΩ-30kΩ	10kΩ-30kΩ
C-B	50kΩ-90kΩ	∞
C-E	40kΩ-80kΩ	∞

11. EXPLODED VIEW AND PARTS LIST

11.1. EXPLODED VIEW



11.2. PARTS LIST

NOTE:

1. **When ordering replacement part(s), please use part number(s) shown in this part list.**
   Do not use description of the part.
2. **Important safety notice:**
   Components identified by mark have special characteristics important for safety.
   When replacing any of these components, use only manufacture's specified parts.

NOTE:

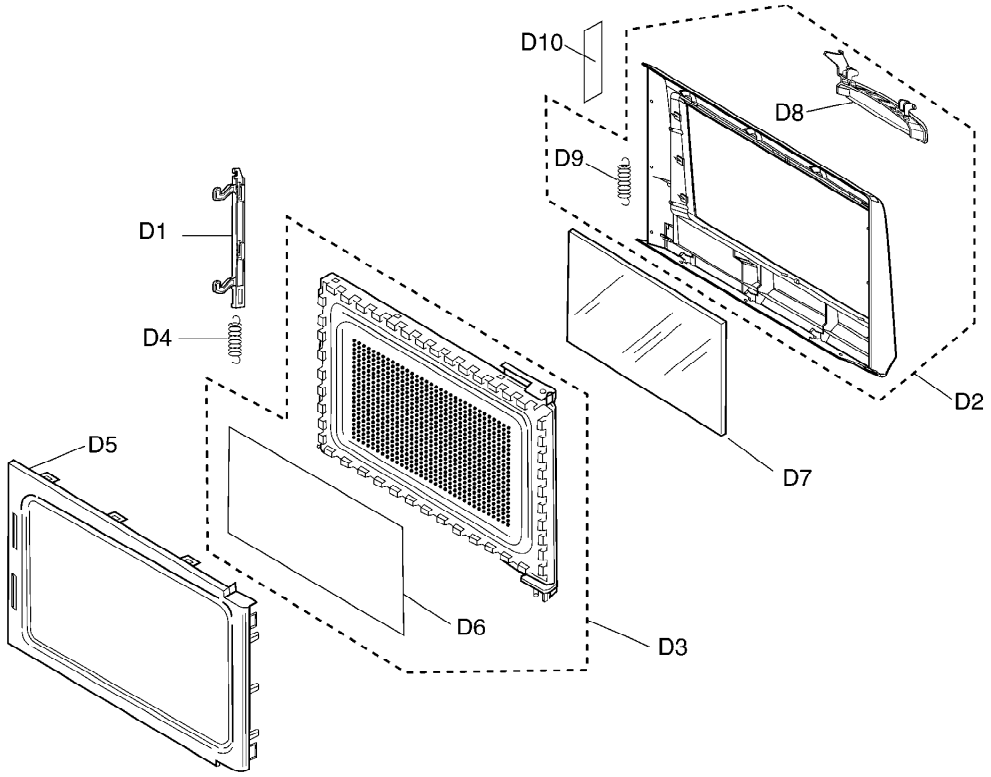
"A" parts are supplied by CSD (Japan)
"F" parts are supplied by PHAMOS (China)

Ref. No.		Part No.	Part Name & Description	Pcs/Set	Remarks
1		F01576S10HQP	NAME PLATE	1	S215WF QPQ
1		F01576S10HHP	NAME PLATE	1	S215WF HPE
1		F01576S10HTP	NAME PLATE	1	S215WF TPE
1		F01576S10STP	NAME PLATE	1	S215MF TPE
1		F01576S10HYT	NAME PLATE	1	S215WF YTE
1		F01576S10SYT	NAME PLATE	1	S215MF YTE
1		F01576S10HMP	NAME PLATE	1	S215WF MPQ
1		F01576S10HYQ	NAME PLATE	1	S215WF YPQ
1		F01576S10SYP	NAME PLATE	1	S215MF YPQ
1		F01576S10HLP	NAME PLATE	1	S215WF LPK
1		F01576S10HKT	NAME PLATE	1	S215WF KTE
1		F01576S10HPT	NAME PLATE	1	S215WF PTE
1		F01576S10HKP	NAME PLATE	1	S215WF KPQ
1		F01576S10HZP	NAME PLATE	1	S215WF ZPE
1		F01576S20HQP	NAME PLATE	1	S235WF QPQ
1		F01576S20HHP	NAME PLATE	1	S235WF HPE
1		F01576S20HTP	NAME PLATE	1	S235WF TPE
1		F01576S20STP	NAME PLATE	1	S235MF TPE
1		F01576S20HYT	NAME PLATE	1	S235WF YTE
1		F01576S20SYT	NAME PLATE	1	S235MF YTE
1		F01576S20HMP	NAME PLATE	1	S235WF MPQ
1		F01576S20HYP	NAME PLATE	1	S235WF YPQ
1		F01576S20SYP	NAME PLATE	1	S235MF YPQ
1		F01576S20HLP	NAME PLATE	1	S235WF LPK
1		F01576S20HKT	NAME PLATE	1	S235WF KTE
1		F01576S20HPT	NAME PLATE	1	S235WF PTE
1		F01576S20HKP	NAME PLATE	1	S235WF KPQ
1		F01576S20HST	NAME PLATE	1	S235WF STM
1		F01576S20HZP	NAME PLATE	1	S235WF ZPE
1		F01576S20SZP	NAME PLATE	1	S235MF ZPE
1		F01576S20BZP	NAME PLATE	1	S235BF ZPE
2		F10016S10XP	BASE	1	
3		F10084T00AP	RUBBER FOOT	2	
4		F110D6E70HXP	CABINET BODY (U)	1	S215WF,S235WF
4		F110D6E70SXP	CABINET BODY (U)	1	S215MF,S235MF
4		F110D6E70BXP	CABINET BODY (U)	1	S235BF
5	⚠	F200A-6S10	OVEN (U)	1	S215WF/MF (EXCEPT ZPE)
5	⚠	F200A6S10XP	OVEN (U)	1	S215WF (ZPE)
5	⚠	F200A6S20AP	OVEN (U)	1	S235WF/MF (EXCEPT ZPE)
5	⚠	F200A6S20XP	OVEN (U)	1	S235WF/MF/BF (ZPE)
6		F20556S10XP	COVER	1	
7		F21316E70XP	PULLY SHAFT	1	
8		F2177-F80	WASHER	1	
9		F290D6S10XP	ROLLER RING (U)	1	
10	⚠	F30206S10XP	DOOR HOOK	1	
11		F31365Q00AP	HOOK LEVER A	1	
12		F400A6S10XP	FAN MOTOR	1	
13		F4008-1E60	FAN BLADE	1	
14		F40256S10XP	AIR GUIDE A	1	
15		F41446S10XP	ORIFICE	1	

Ref. No.		Part No.	Part Name & Description	Pcs/Set	Remarks
16		F612E5G50XN	INCANDESCENT LAMP (U)	1	EXCEPT HPE
17	⚠	J61424T00AP	MICRO SWITCH	1	PRIMARY LATCH SWITCH
17	⚠	J61424T00AP	MICRO SWITCH	1	SECONDARY LATCH SWITCH (S215WF/MF)
18	⚠	J61414T00AP	MICRO SWITCH	1	SECONDARY LATCH SWITCH (S235WF/MF/BF)
20	⚠	F61456S10XP	THERMAL CUTOUT	1	60°C ON,180°C OFF
21	⚠	J61784T00AP	MICRO SWITCH	1	SHORT SWITCH
22	⚠	2M211A-M1J	MAGNETRON	1	EXCEPT STM
22	⚠	2M210-M1J	MAGNETRON	1	STM
23	⚠	F60906N60XP	H.V.CAPACITOR	1	EXCEPT LPK & STM
23	⚠	F6090-1H70	H.V.CAPACITOR	1	LPK
23	⚠	F60906S20SN	H.V.CAPACITOR	1	STM
24		F60376S10XP	CAPACITOR BRACKET	1	
25	⚠	F621B6S10HP	H.V.TRANSFORMER	1	HPE,TPE,YTE,KTE,PTE,ZPE
25	⚠	F621B6S10LP	H.V.TRANSFORMER	1	LPK
25	⚠	F621B6S10MP	H.V.TRANSFORMER	1	QPQ,MPQ,YPQ,KPQ
25	⚠	F621B6S20ST	H.V.TRANSFORMER	1	STM
26	⚠	F605V6N60XP	DIODE (U)	1	
27	⚠	ANE6230Z70BP	FUSE	1	
29		F63266S10XP	TURNTABLE MOTOR	1	
30	⚠	F900C6S10QP	AC CORD W/PLUG	1	QPQ
30	⚠	F900C6S10YT	AC CORD W/PLUG	1	S215*F (HPE,MPQ,YTE,KTE,KPQ)
30	⚠	F900C6S20YT	AC CORD W/PLUG	1	S235*F (HPE,MPQ,YTE,KTE,KPQ)
30	⚠	F900C6S10TP	AC CORD W/PLUG	1	S215*F (TPE,PTE)
30	⚠	F900C6S10ZP	AC CORD W/PLUG	1	ZPE,S235*F (TPE,PTE)
30	⚠	F900C6S10YP	AC CORD W/PLUG	1	S215*F (YPQ)
30	⚠	F900C6S20YP	AC CORD W/PLUG	1	S235*F (YPQ)
30	⚠	F900C6S10LP	AC CORD W/PLUG	1	S215WF (LPK)
30	⚠	F900C6S20AP	AC CORD W/PLUG	1	S235WF (LPK)
30	⚠	F900C6S20ST	AC CORD W/PLUG	1	STM
31	⚠	F61456N00AP	THERMAL CUTOUT	2	-20°C ON ,120°C OFF
32		F60366S10XP	CAPACITOR INSTALLATION BRACKET	1	
33		F11656S10XP	REINFORCE BRACKET	1	
34		F60706S10XP	INSULATE BRACKET	1	
35		F603Y6S20QP	D.P.CIRCUIT (DU)	1	S235*F (QPQ & ZPE)
35		F603Y6S20ST	D.P.CIRCUIT (DU)	1	S235WF (STM)
35		F603Y6S20XP	D.P.CIRCUIT (DU)	1	S235*F (EXCEPT QPQ,STM & ZPE)
36		F00065540MN	CAUTION LABEL	1	YPQ
37		F00068100HN	CAUTION LABEL	1	EXCEPT ZPE
38		F00065E90ZP	CAUTION LABEL	1	ZPE
41		F02846S10HYP	NO. LABEL	1	S215WF YPQ
41		F02846S10SYP	NO. LABEL	1	S215MF YPQ
41		F02846S20HYP	NO. LABEL	1	S235WF YPQ
41		F02846S20SYP	NO. LABEL	1	S235MF YPQ
45		XTWFA4+12T	SCREW	4	FOR MAGNETRON
46		XTWFA4+12D	SCREW	3	FOR CABINET BODY

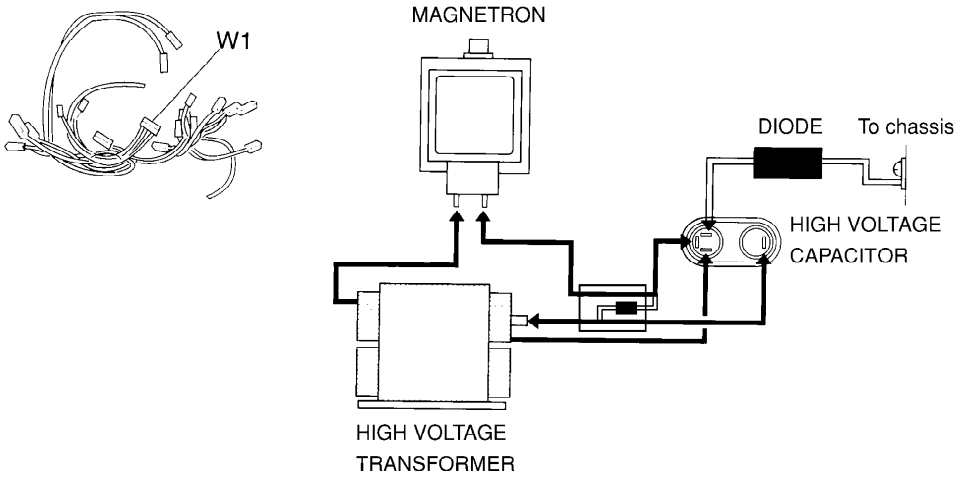
Ref. No.		Part No.	Part Name & Description	Pcs/Set	Remarks
47		XTTFA4+6BN	SCREW	2	FOR CABINET BODY SIDE
49		F02395E20KN	CORD CAUTION LABEL	1	KTE,PTE,KPQ,STM
51		F60305G60HN	INCANDESCENT LAMP	1	HPE
52		F61525H00AP	SOCKET	1	HPE
53		F692Y6S10QP	NOISE FILTER (U)	1	S215WF (QPQ & ZPE)

11.3. DOOR ASSEMBLY



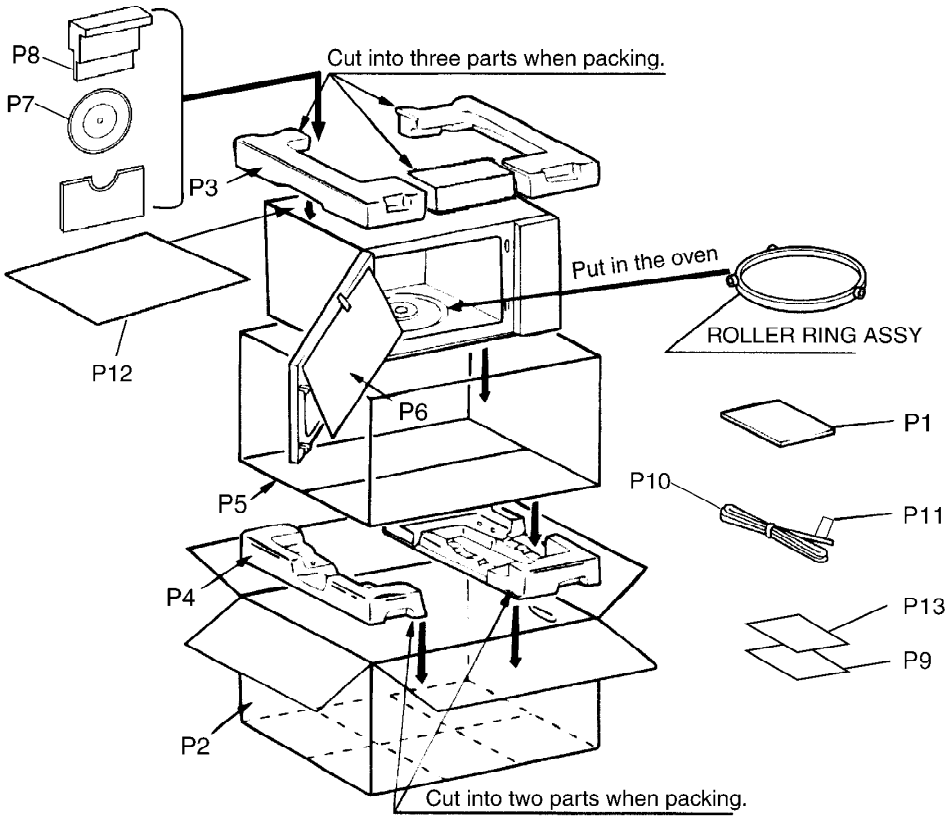
Ref. No.		Part No.	Part Name & Description	Pcs/Set	Remarks
D1		F30186S10XP	DOOR KEY A	1	
D2	⚠	F301A6S10HXP	DOOR A (U)	1	S215WF (EXCEPT QPQ & ZPE),S235WF (EXCEPT QPQ)
D2	⚠	F301A6S10HAP	DOOR A (U)	1	S215WF (QPQ,ZPE),S235WF (QPQ)
D2	⚠	F301A6S10SXP	DOOR A (U)	1	S215MF,S235MF
D2	⚠	F301A6S10BAP	DOOR A (U)	1	S235BF
D3	⚠	F302K6S10XP	DOOR E (U)	1	
D4		F30216S10XP	DOOR KEY SPRING	1	
D5	⚠	F30856S10XP	DOOR C	1	
D6	⚠	F31455G10XN	DOOR SCREEN A	1	
D7		F31466S10XP	DOOR SCREEN B	1	
D8		F30126S10KXP	DOOR HANDLE	1	S215WF (EXCEPT QPQ & ZPE),S235WF (EXCEPT QPQ)
D8		F30126S10HXP	DOOR HANDLE	1	S215WF (QPQ,ZPE),S235WF (QPQ)
D9		F30216S10XP	HANDLE SPRING	1	
D10		F01729660JP	CAUTION LABEL B	1	QPQ
D10		F02459660AP	DHHS LABEL	1	LPK

11.4. WIRING MATERIALS



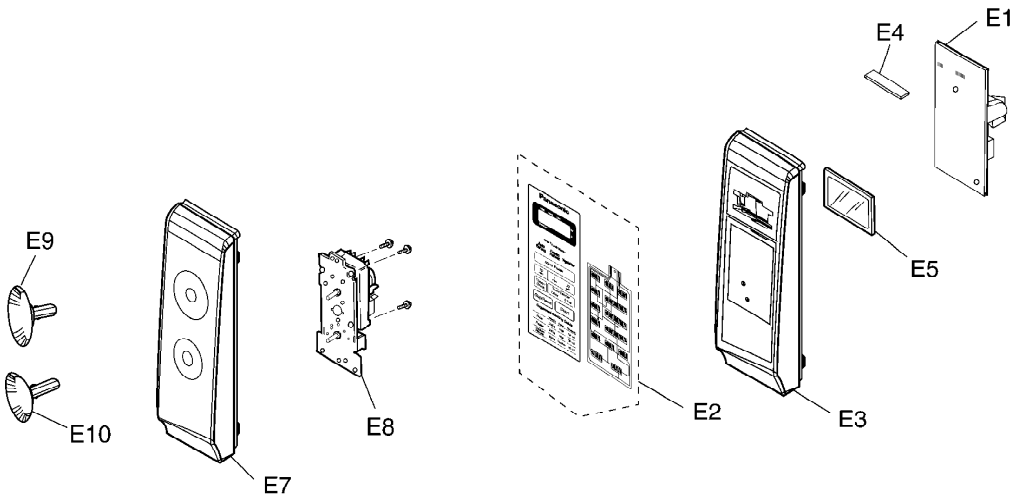
Ref. No.		Part No.	Part Name & Description	Pcs/Set	Remarks
W1		F030A-6S10	LEAD WIRE HARNESS	1	S215WF (QPQ,ZPE)
W1		F030A6S10XP	LEAD WIRE HARNESS	1	S215WF/MF (EXCEPT QPQ & ZPE)
W1		F030A6S20XP	LEAD WIRE HARNESS	1	S235WF/MF/BF

11.5. PACKING AND ACCESSORIES



Ref. No.		Part No.	Part Name & Description	Pcs/Set	Remarks
P1		F00036S10QP	INSTRUCTION MANUAL	1	QPQ
P1		F00036S10HP	INSTRUCTION MANUAL	1	HPE,TPE,YTE,MPQ,YPQ,LPK
P1		F00036S10KP	INSTRUCTION MANUAL	1	KTE,PTE,KPQ,STM
P1		F00036S10ZP	INSTRUCTION MANUAL	1	ZPE
P2		F01026S10HQP	PACKING CASE,PAPER	1	S215WF (QPQ)
P2		F01026S10HHP	PACKING CASE,PAPER	1	S215WF (HPE,TPE,MPQ,YPQ,LPK)
P2		F01026S10HYT	PACKING CASE,PAPER	1	S215WF (YTE)
P2		F01026S10HKT	PACKING CASE,PAPER	1	S215WF (KTE,PTE)
P2		F01026S10HKP	PACKING CASE,PAPER	1	S215WF (KPQ)
P2		F01026S10HZP	PACKING CASE,PAPER	1	S215WF (ZPE)
P2		F01026S10SHP	PACKING CASE,PAPER	1	S215MF (TPE,YPQ)
P2		F01026S10SYT	PACKING CASE,PAPER	1	S215MF (YTE)
P2		F01026S20HQP	PACKING CASE,PAPER	1	S235WF (QPQ)
P2		F01026S20HHP	PACKING CASE,PAPER	1	S235WF (HPE,TPE,MPQ,YPQ,LPK)
P2		F01026S20HYT	PACKING CASE,PAPER	1	S235WF (YTE)
P2		F01026S20HKT	PACKING CASE,PAPER	1	S235WF (KTE,PTE)
P2		F01026S20HKP	PACKING CASE,PAPER	1	S235WF (KPQ,STM)
P2		F01026S20HZP	PACKING CASE,PAPER	1	S235WF (ZPE)
P2		F01026S20SHP	PACKING CASE,PAPER	1	S235MF (TPE,YPQ)
P2		F01026S20SYT	PACKING CASE,PAPER	1	S235MF (YTE)
P2		F01026S20SZP	PACKING CASE,PAPER	1	S235MF (ZPE)
P2		F01026S20BZP	PACKING CASE,PAPER	1	S235BF (ZPE)
P3		F01045G40XN	UPPER FILLER	1	
P4		F01056S10XP	LOWER FILLER	1	
P5		F01066S10XP	P.E BAG	1	
P6		F01075G10XN	DOOR SHEET	1	
P7		A06015G10XN	COOKING TRAY	1	
P8		F01136E70XP	TRAY STYROL	1	
P9		F00065G40AP	CAUTION LABEL	1	QPQ
P10		F9164-5G10	EARTH LEAD	1	TPE
P11		F00324040XN	EARTH CAUTION LABEL	1	TPE
P12		F01924T00AP	SHEET	1	S215MF,S235MF/BF
P13		F04456S20HTP	OVERLAY	1	S235WF (TPE)
P13		F04456S20HMP	OVERLAY	1	S235WF (MPQ,YPQ)
P13		F04456S20HKT	OVERLAY	1	S235WF (KTE,PTE,KPQ,STM)
P13		F04456S20STP	OVERLAY	1	S235MF (TPE)
P13		F04456S20SMP	OVERLAY	1	S235MF (YPQ)

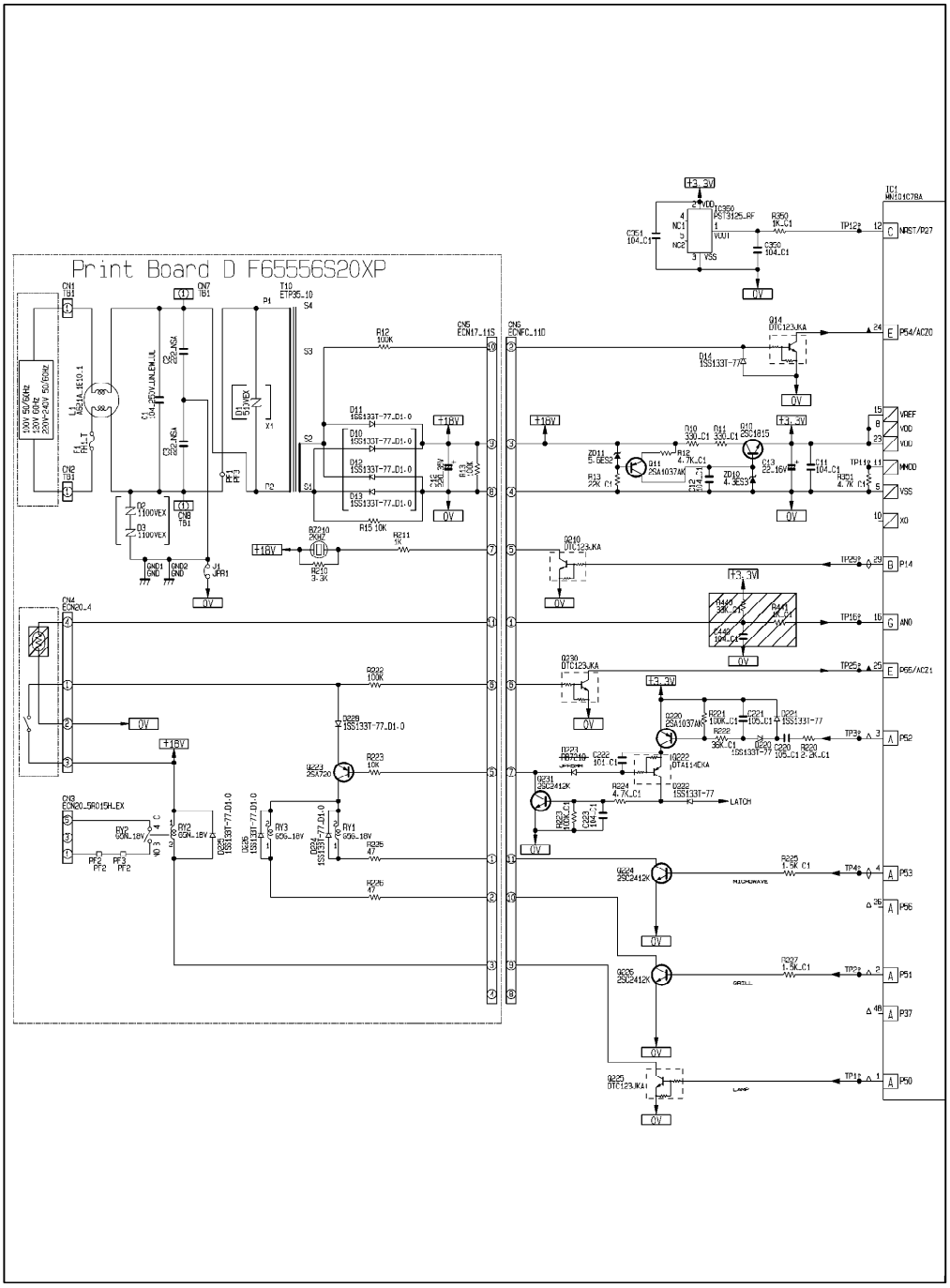
11.6. ESCUTCHEON BASE ASSEMBLY

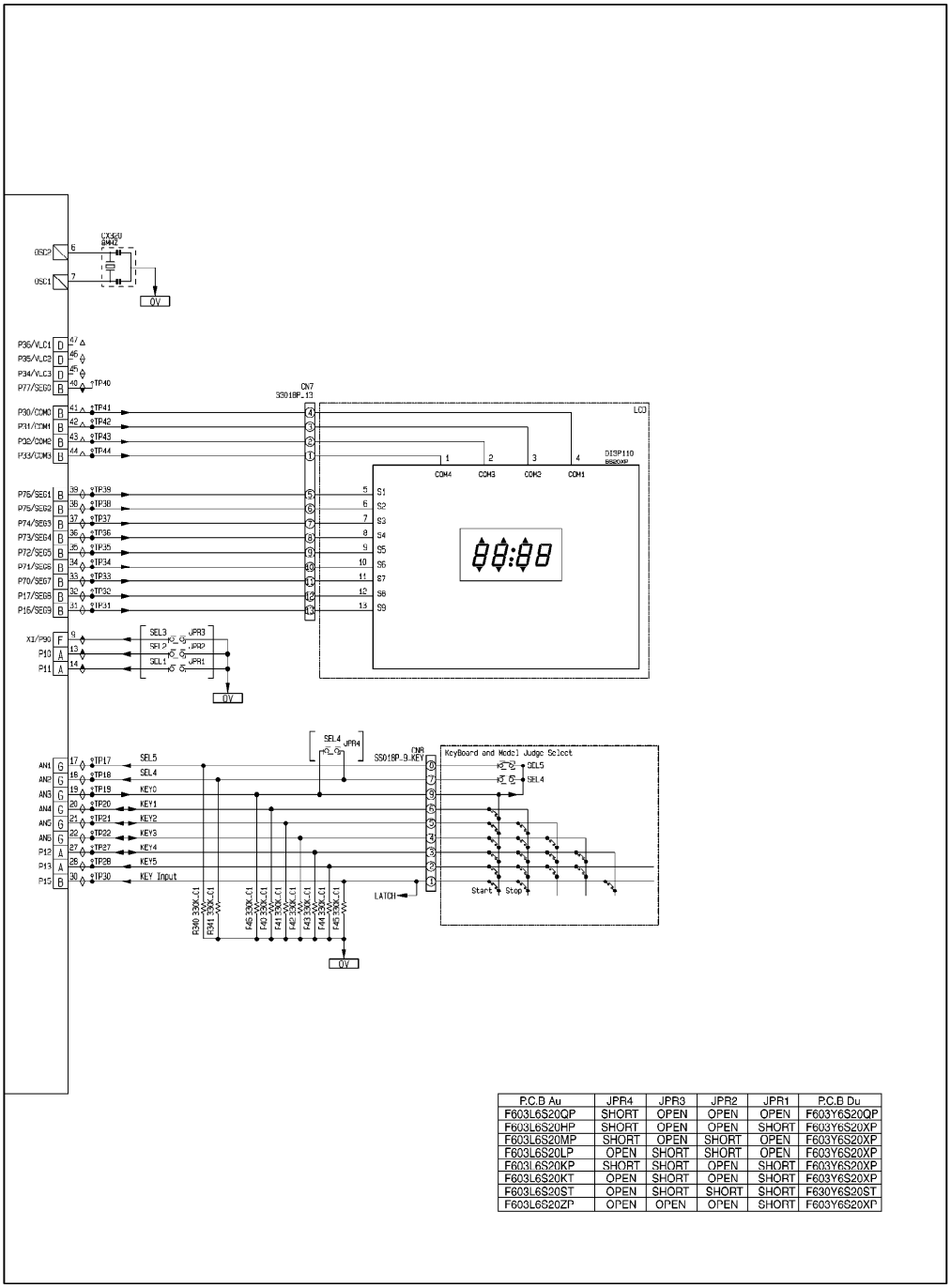


Ref. No.		Part No.	Part Name & Description	Pcs/Set	Remarks
E1		F603L6S20QP	D.P.CIRCUIT (AU)	1	S235WF (QPQ)
E1		F603L6S20HP	D.P.CIRCUIT (AU)	1	S235*F (HPE,TPE,YTE)
E1		F603L6S20MP	D.P.CIRCUIT (AU)	1	S235*F (MPQ,YPQ)
E1		F603L6S20LP	D.P.CIRCUIT (AU)	1	S235WF (LPK)
E1		F603L6S20KP	D.P.CIRCUIT (AU)	1	S235WF (KPQ)
E1		F603L6S20KT	D.P.CIRCUIT (AU)	1	S235WF (KTE,PTE)
E1		F603L6S20ST	D.P.CIRCUIT (AU)	1	S235WF (STM)
E1		F603L6S20ZP	D.P.CIRCUIT (AU)	1	S235*F (ZPE)
E2		F630Y6S20HQP	MEMBRANE SWITCH (U)	1	S235WF (QPQ)
E2		F630Y6S20HHP	MEMBRANE SWITCH (U)	1	S235WF (HPE,TPE,YTE,MPQ,YPQ,LPK)
E2		F630Y6S20HKT	MEMBRANE SWITCH (U)	1	S235WF (KTE,PTE,KPQ,STM)
E2		F630Y6S20HZP	MEMBRANE SWITCH (U)	1	S235WF (ZPE)
E2		F630Y6S20SHP	MEMBRANE SWITCH (U)	1	S235MF (TPE,YTE,YPQ)
E2		F630Y6S20SZP	MEMBRANE SWITCH (U)	1	S235MF (ZPE)
E2		F630Y6S20BZP	MEMBRANE SWITCH (U)	1	S235BF (ZPE)
E3		F80346S20SXP	ESCUTCHEON BASE	1	S235WF
E3		F80346S20HXP	ESCUTCHEON BASE	1	S235MF
E3		F80346S20BXP	ESCUTCHEON BASE	1	S235BF
E4		F67006S20XP	RUBBER CONNECTOR	1	S235WF/MF/BF
E5		AEDDHJ6S20XP	DISPLAY	1	S235WF/MF/BF
E7		F80346S10HQP	ESCUTCHEON BASE	1	S215WF (QPQ)
E7		F80346S10HHP	ESCUTCHEON BASE	1	S215WF (HPE,TPE,YTE,MPQ,YPQ,LPK)
E7		F80346S10HKT	ESCUTCHEON BASE	1	S215WF (KTE,PTE,KPQ)
E7		F80346S10HZP	ESCUTCHEON BASE	1	S215WF (ZPE)
E7		F80346S10SHP	ESCUTCHEON BASE	1	S215MF (TPE,YTE,YPQ)
E8		F60016S10XP	TIMER	1	S215WF/MF (EXCEPT LPK)
E8		F60016S10LP	TIMER	1	S215WF (LPK)
E9		F80206S10KXP	TIMER KNOB	1	S215WF/MF
E10		F83926S10KXP	TIMER KNOB	1	S215WF/MF

12. DIGITAL PROGRAMMER CIRCUIT (NN-S235WF/MF/BF)

12.1. SCHEMATIC DIAGRAM


Print Board D F65556S20XP
+3.3V
+18V
0V
IC1
MN101C78A
LATCH
LAMP



P.C.B Au	JPR4	JPR3	JPR2	JPR1	P.C.B Du
F603L6S20QP	SHORT	OPEN	OPEN	OPEN	F603Y6S20QP
F603L6S20HP	SHORT	OPEN	OPEN	SHORT	F603Y6S20XP
F603L6S20MP	SHORT	OPEN	SHORT	OPEN	F603Y6S20XP
F603L6S20LP	OPEN	SHORT	SHORT	OPEN	F603Y6S20XP
F603L6S20KP	SHORT	SHORT	OPEN	SHORT	F603Y6S20XP
F603L6S20KT	OPEN	SHORT	OPEN	SHORT	F603Y6S20XP
F603L6S20ST	OPEN	SHORT	SHORT	SHORT	F630Y6S20ST
F603L6S20ZP	OPEN	OPEN	OPEN	SHORT	F603Y6S20XP

12.2. PARTS LIST

Ref. No.	Part No.	Part Name & Description	Pcs/Set	Remarks
BZ210	AEFBAT2001WQ	BUZZER	1	2.0KHz
C12	AECETS1V221B	AL CHEM CAPACITOR	1	220 μ F/35V
C222	AECUU06C101J	CHIP CAPACITOR	1	100PF/50V
C11,C12,C223,C350,C351	AECUT06F104Z	CHIP CAPACITOR	5	0.1 μ F/25V
C220,C221	AECUN06F105Z	CHIP CAPACITOR	2	1 μ F/10V
C13	AECETS1C220B	CHIP CAPACITOR	1	22 μ F/16V
C1	ECQU2A474BP7	CAPACITOR	1	0.1 μ F/250V
C2,C3	ECTJ10222ME	CAPACITOR	2	0.0022 μ F/250V
CN1,CN2,CN7,CN8	F62146D00XN	CONNECTOR	4	
CN3	K1KA03AA0115	CONNECTOR	1	
CN4	F03536S20XP	LEAD WIRE HARNESS	1	
CN5	K1MN11A00008	CONNECTOR	1	
CN6	F65906S20XP	FLAT CABLE	1	11 pin
L1	F621A6S20AP	FILTER COIL	1	
CX320	EFOEC8004A4	CERAMIC RESONATOR	1	8.00MHz
D14,D220-D225,D228	AESS133T-77	DIODE	8	
D1	AERZ511KSBN	VARISTOR	1	
D2,D3	AERZ102KSBN	VARISTOR	2	
D11	AESSRCT1A6-E	DIODE	1	
IC1	MN101C78ADF	L.S.I.	1	
IC350	COEBE0000401	CMOS CHIP	1	
Q10	2SD1859TV2Q	TRANSISTOR	1	
Q11,Q220	2SA1037AK	CHIP TRANSISTOR	2	
Q222	AESA14EKE	CHIP DIGI-TRANSISTOR	1	
Q14,Q210,Q225,Q230	AESC23JKE	CHIP DIGI-TRANSISTOR	4	
Q224,Q231	2SC2412KT146	CHIP TRANSISTOR	2	
Q223	B1ACGF000004	AUDION	1	
R350	AERJ06J102R	CHIP RESISTOR	1	1K Ω,1/10W,5%
R221,R223	AERJ06J104R	CHIP RESISTOR	2	100K Ω,1/10W,5%
R225,R227	AERJ06J152R	CHIP RESISTOR	2	1.5K Ω,1/10W,5%
R220	AERJ06J222R	CHIP RESISTOR	1	2.2K Ω,1/10W,5%
R13	AERJ06J223R	CHIP RESISTOR	2	22 Ω,1/10W,6%
R10,R11	AERJ06J331R	CHIP RESISTOR	2	330 Ω,1/10W,4%
R40-R46,R340,R341	AERJ06J334R	CHIP RESISTOR	9	330K Ω,1/10W,6%
R222	AERJ06J363R	CHIP RESISTOR	1	36K Ω,1/10W,7%
R12,R224,R351	AERJ06J472R	CHIP RESISTOR	3	4.7K Ω,1/10W,6%
R211	D0AF102JA155	CARBON RESISTOR	1	1K Ω,1/4W,5%
R15,R223	D0AF103JA155	CARBON RESISTOR	2	10K Ω,1/4W,5%
R12,R13,R222	D0AF104JA155	CARBON RESISTOR	3	100K Ω,1/4W,5%
R210	D0AF332JA155	CARBON RESISTOR	1	3.3K Ω,1/4W,5%
R225	D0AF470JA155	CARBON RESISTOR	1	47 Ω,1/4W,5%
RY1	AEGG5G1A12	POWER RELAY	1	
RY2	AEBLD118	POWER RELAY	1	
T10	AETP284T0AP	LOW VOLTAGE TRANSFORMER	1	
ZD10	BOBA4R400002	ZENER DIODE	1	
ZD11	AESZMTZJ5R6B	ZENER DIODE	1	
F1	A62316010BP	FUSE HOLDER	2	

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